

# FLORA OF JAMAICA

VOL. III.

DICOTYLEDONS

FAMILIES PIPERACEÆ TO CONNARACEÆ



# FLORA OF JAMAICA

CONTAINING DESCRIPTIONS OF  
THE FLOWERING PLANTS KNOWN  
FROM THE ISLAND

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(NATURAL HISTORY)

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## P R E F A C E

THIS volume is a continuation of a systematic account of the flowering plants of the Island of Jamaica, the first volume of which, on the Orchids, was published in 1910. The remainder of the Monocotyledons will form the subject of Vol. II., and it is estimated that the Dicotyledons will be completed in three more volumes, making six in all. As with the first volume, the larger part of the work of preparation has been done by Mr. Fawcett, but both authors are jointly responsible.

We are again indebted to the Government of Jamaica for the loan of the Jamaican Herbarium, and also for a generous grant towards the expense of the preparation of the work. We have also gratefully to acknowledge facilities for the study of the specimens in the Herbarium at the Royal Gardens, Kew, and the loan from the Director of the Edinburgh Botanic Garden of the Jamaican specimens in the Herbarium under his charge.

To the list of individuals and botanical institutions whose help we have previously acknowledged, we must add the Botanical Museum at Copenhagen, and the Botanical Department of the Naturhistoriska Riks-Museum at Stockholm.

Since the publication of the first volume we have ascertained the existence in the Bristol Museum of an interesting collection made in Jamaica by Dr. Arthur Broughton between the years 1783 and 1796, together with a series of drawings (1761-69) by the Rev. John Lindsay, and we are indebted to the Bristol Museum for the loan of these.

The descriptions have been drawn up with special reference to West Indian specimens. We have thought it useful to include an illustration of each genus; these, with the exception of a few plates, are included in the text; the drawings have been made under our supervision by Mr. Percy Highley.

A. B. RENDLE.

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CROMWELL ROAD, LONDON, S.W.

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## LIST OF PLATES

PLATE 1. A. 1-5, *Peperomia verticillata*; B. 1-9, Species of *Pilea*.

PLATE 2. Species of *Pilea*.

PLATE 3. Species of *Pilea*.

PLATE 4. *Dendrophthora opuntioides*.

PLATE 5. *Scybalium jamaicense*.

NAMES OF COLLECTORS AND CONTRIBUTORS  
WITH DATE OF COLLECTION

BALL, J. 1882.	LANE, A. W. 1843.
BANCROFT, E. N. 1811-42.	LINDSAY, J. fl. 1790.
BARHAM, H. 1680-1726.	MACFADYEN, J. 1825-50.
BERTERO, C. 1821.	MARCH, W. T. 1857, 8.
BOVELL, J. R. 1914-	MASSON, F. 1781.
BRITTON, N. L. and MRS. 1906-	MCNAB, G. 1838-59.
BROMFIELD, W. A. 1844.	METCALFE, . 1859-60.
BROUGHTON, A. 1783-96.	MILLAR, R. 1735, 6.
BROWNE, P. 1746-55.	MILLSPAUGH, C. F. 1899-1900.
CAMPBELL, E. 1894-6.	MOORE, A. 1883-
CLUTE, W. N. 1900.	MORRIS, SIR DANIEL. 1879-86.
CRAIG, R. 1904-	NICHOLS, G. E. 1903, 6.
CUMING, H. 1831.	OERSTED, A. S. 1846.
DANCER, T. 1773-1811.	PARNELL, R. 1839, 40.
DISTIN, H. 1830-40.	PONTHIEU, H. DE. 1778.
EGGERS, H. von. 1888.	PRIOR, R. C. ALEXANDER. 1849-50.
FAWCETT, W. 1887-1908.	PURDIE, W. 1843, 4.
GOSSE, P. H. 1844, 5.	ROHR, J. P. B. von. 1786.
HARRIS, W. 1881-	SHAKSPEAR, R. 1777-82.
HART, J. H. 1881-6.	SLOANE, SIR HANS. 1687-9.
HARTWEG, K. T. 1843.	SWARTZ, O. 1784, 5, 6.
HEWARD, R. 1823-26.	THOMPSON, W. J. 1889-1908.
HITCHCOCK, A. S. 1890, 1.	TUSSAC, F. R. DE. 1802.
HOUSTOUN, W. 1729-33.	WATT, D. E. 1890-
JACQUIN, N. J. 1758.	WILES, J. 1793-1806.
JENMAN, G. S. 1873-9.	WILSON, N. 1846-74.
KREBS, H. J. Between 1843 and 1866.	WRIGHT, W. 1764-85.
	WULLSCHLAEDEL, H. R. 1847-9.

CONSPECTUS OF THE FAMILIES CONTAINED IN  
THIS VOLUME

DICOTYLEDONS

Stems with open bundles. Leaves mostly net-veined. Floral parts generally in fours or fives. Embryo normally with two cotyledons.

FAMILIES *PIPERACEÆ* TO *CONNARACEÆ*

Fam. 1. *Piperaceæ*. Fls. *hermaphrodite*, without a perianth, minute, in fleshy spikes, more or less covered by bracts. Herbs or shrubs. Leaves alternate, opposite or whorled, without stipules. (Page 1.)

Fam. 2. *Chloranthaceæ*. Fls. monœcious or diœcious, minute, not covered by bracts; male fl. without a perianth, in spikes; female fl. with inconspicuous perianth, in panicles. *Aromatic shrubs*. Leaves opposite; stipules united into a sheath enclosing the stem. (Page 27.)

Fam. 3. *Lacistemaceæ*. Fls. *hermaphrodite*, with perianth of distinct unequal segments more or less covered by imbricated bracts, minute, in spikes. Small trees. Leaves alternate, distichous, without stipules. (Page 29.)

[Fam. 3A. *Salicaceæ*. Fls. diœcious, small, without a perianth, in catkins, more or less covered by bracts. Seeds woolly. Trees. Leaves alternate; stipules free.] (Page 30.)

Fam. 4. *Myricaceæ*. Fls. unisexual, minute, without a perianth, in spikes, more or less covered by bracts. Small trees or shrubs, generally aromatic. Leaves alternate, without stipules. *Fruit waxy outside*. (Page 31.)

Fam. 5. *Juglandaceæ*. Fls. monœcious, small; perianth calycine, epigynous; male fls. in catkins; female fls. in erect terminal spikes. Trees. Leaves alternate, *imparipinnate*, without stipules, *aromatic*. *Fruit walnut-like*. (Page 33.)

Fam. 6. *Batidaceæ*. Fls. diœcious, minute, in strobiles; male fls.: scales free, imbricate in 4 rows, perianth cup-shaped; female fls.: scales in alternating pairs; perianth wanting. *Maritime shrub*. Leaves opposite, fleshy, semiterete. *Ovaries united to form a fleshy compound fruit*. (Page 34.)

Fam. 7. **Ulmaceæ.** Fls. unisexual, monœcious or polygamous, minute, in small, panicle-like inflorescences, or the fertile solitary; perianth calycine. Trees or shrubs with a watery sap. Leaves alternate, *3-nerved at base*; stipules caducous. Fruit *small, drupaceous*, one-seeded. (Page 36.)

Fam. 8. **Moraceæ.** Fls. monœcious or diœcious, minute, perianth calycine, or wanting; fls. massed together in various ways, rarely the female solitary. Trees or shrubs generally *with milky juice*. Leaves alternate, entire (palmatilobed in *Cecropia*). Fruit often composed of the union of one or several ovaries with enlarged fleshy bracts, perianth, or receptacle, one-seeded. (Page 40.)

Fam. 9. **Urticaceæ.** Fls. monœcious or diœcious, minute, clustered or scattered, clusters or flowers paniculate or crowded and sessile; perianth calycine or wanting. Herbs, shrubs or small trees. Leaves alternate or opposite, with stipules often caducous, *sometimes with cystoliths*. Fruit *an achene, sometimes enclosed in the perianth*. (Page 54.)

Fam. 10. **Olaeaceæ.** Fls. *hermaphrodite*, small, axillary, in short inflorescences, or solitary; *calyx persistent, toothed, or cup-shaped and entire*; *corolla of free or united petals*. Shrubs or trees. Leaves alternate, entire, without stipules. Fruit a drupe. (Page 85.)

Fam. 11. **Loranthaceæ.** Fls. unisexual or hermaphrodite, usually small, in spikes, racemes or panicles; calyx epigynous, small, sometimes reduced to a ring or altogether wanting, corolla of free or united petals. *Small shrubs, parasitic on branches of trees or shrubs*. Leaves opposite, large, or reduced to scales, or wanting. Fruit baccate. (Page 88.)

Fam. 12. **Balanophoraceæ.** Fls. unisexual, minute, crowded on unisexual or androgynous spadices; perianth calycine or wanting. *Fungus-like fleshy herbs without chlorophyll, parasitic on roots*. Leaves represented by scales. (Page 103.)

Fam. 13. **Aristolochiaceæ.** Fls. hermaphrodite, large, generally solitary; *perianth irregular, coloured, tubular, constricted above the ovary, prolonged above into a limb which is sometimes tailed*; *stamens united with the pistil*; ovary inferior, 6-celled. Herbaceous or shrubby, twining. Leaves alternate, without stipules. Fruit a 6-valved capsule. (Page 104.)

Fam. 14. **Polygonaceæ.** Fls. hermaphrodite or unisexual, small, solitary or clustered within a bract, racemose or paniculate; perianth inferior, calycine, sometimes coloured. Herbs, shrubs, or trees. Leaves alternate, usually entire; *stipules tubular (ochrea) sheathing the stem*. Fruit a nut enclosed by the perianth. (Page 106.)

Fam. 15. **Chenopodiaceæ.** Fls. hermaphrodite or monœcious, small, in clusters which are sometimes in simple or branched spikes; perianth calycine, or sometimes wanting in female fls. Herbs or shrubs, often *with mealy hairs*. Leaves alternate, without stipules, sometimes reduced to scales. *Fruit a utricle enclosed in the perianth or at the base of the enlarged and hardened bracts.* (Page 122.)

Fam. 16. **Amarantaceæ.** Fls. hermaphrodite or monœcious or diœcious, small or minute, usually in terminal simple or panicled spikes, cymes or clusters, each fl. with *scarious bract and bracteoles*; *perianth scarious, persistent*, sometimes wanting in female fl. Herbs, rarely shrubs. Leaves opposite or alternate, entire, without stipules. *Fruit a utricle enclosed in, or resting upon, the perianth, or enveloped by the bract and bracteoles.* (Page 126.)

Fam. 17. **Nyetaginaceæ.** Fls. hermaphrodite or unisexual and diœcious, large or minute, *in paniculate corymbs or rarely umbellulate*; *perianth corolla-like, segments united, the basal portion enclosing and adhering to the fruit*, surrounded by a calyx-like involucre in *Mirabilis*. Herbs, shrubs, or trees. Leaves opposite or partly alternate (in *Pisonia*), entire, without stipules. (Page 145.)

Fam. 18. **Phytolaccaceæ.** Fls. hermaphrodite, *small, white, in racemes*; *perianth corolla-like, or rarely with calyx and corolla*. Herbs or shrubs. Leaves alternate, entire; stipules wanting or small. Fruit various. (Page 154.)

Fam. 19. **Ficoideaceæ.** Fls. hermaphrodite, small, solitary or in clusters or paniculate; *perianth calycine, persistent*. Herbs. Leaves opposite, alternate or spuriously whorled, entire. *Fruit a capsule.* (Page 162.)

Fam. 20. **Portulacaceæ.** Fls. hermaphrodite, small, solitary or crowded at apex or paniculate or racemose; *sepals 2; petals 4-6, very deciduous*. Herbs. Leaves alternate or subopposite, entire; stipules wanting, or scarious, minute or changed into hairs. *Fruit a capsule.* (Page 168.)

Fam. 21. **Basellaceæ.** Fls. hermaphrodite, small, in spikes or panicles; *sepals 2; corolla 5-partite*. Herbs *with twining stems*. Leaves alternate, entire, without stipules. *Fruit a utricle, enclosed in the perianth.* (Page 172.)

Fam. 22. **Caryophyllaceæ.** Fls. hermaphrodite, small or of moderate size, *in cymes; sepals 5, persistent*, in *Silene* united into a 5-toothed tubular calyx; petals 5; *ovary 1-celled with a central placenta*. Herbs with swollen nodes. Leaves opposite, entire; stipules none, or small and scarious. Fruit a capsule. (Page 175.)

Fam. 23. **Nymphaeaceæ.** Fls. *showy*, hermaphrodite, solitary on scapes; sepals usually 4; petals and stamens numerous. *Fresh-water herbs with peltate leaves.* (Page 182.)

Fam. 24. **Ceratophyllaceæ.** Fls. *minute*, monoecious, solitary; perianth calycine. *Fresh-water submerged herbs. Leaves with linear divisions, whorled.* (Page 186.)

Fam. 25. **Ranunculaceæ.** Fls. hermaphrodite or polygamodioecious, of moderate size, in simple or branched inflorescences; perianth petaloid, or calyx and corolla; stamens numerous; ovaries numerous, distinct. Herbs or shrubby climbers. *Leaves divided or compound, without stipules. Fruit a head of achenes.* (Page 187.)

Fam. 26. **Menispermaceæ.** Fls. dioecious, minute, paniculate or racemose; sepals 6 (in 2 series), or 4, or only one in female fl. of *Cissampelos*; petals distinct or united into a short cup, or only one in female fl. of *Cissampelos*; stamens 6 free, or 4 united; ovaries 3 distinct, or 1. Climbing shrubs or trees. Leaves alternate, without stipules, entire. Fruit drupaceous. (Page 190.)

Fam. 27. **Annonaceæ.** Fls. hermaphrodite, small or of moderate size, solitary or clustered; sepals 3; petals 6 in 2 series (inner series sometimes minute or wanting); stamens numerous with the connective produced. Trees or shrubs. Leaves alternate, entire, without stipules. Carpels free or united into a single large fruit. *Endosperm ruminate.* (Page 194.)

Fam. 28. **Lauraceæ.** Fls. hermaphrodite or dioecious in some species of *Ocotea*, small, generally paniculate; perianth inferior, calycine; anthers with 4 or 2 cells opening by valves. Trees or shrubs or parasitic twining herbs (*Cassytha*). Leaves alternate, without stipules. *Fruit a 1-seeded berry, with a cupule formed of the enlarged and persistent perianth, or only the tube persistent, or rarely without a cupule, the whole perianth being deciduous (*Hufelandia*).* (Page 203.)

Fam. 29. **Hernandiaceæ.** Fls. monoecious, corymbose or paniculate, small; perianth superior, petaloid; anthers 2-celled, opening by valves; female fl. surrounded at the base by a cupular involucel, which increases and completely envelops the fruit. Trees. Leaves alternate, without stipules. (Page 219.)

Fam. 30. **Papaveraceæ.** Fls. hermaphrodite, large, showy and solitary, or small in large panicles; sepals 2 or 3; petals hypogynous or wanting; stamens numerous, hypogynous. Herbs or shrubs, with coloured juice. Leaves alternate, lobed, without stipules. *Fruit a capsule.* (Page 221.)

Fam. 31. **Capparidaceæ.** Fls. hermaphrodite, generally large and showy in racemes, sometimes solitary; *sepals 4, petals 4; stamens numerous, or, if few, not tetrodynamous*; ovary generally stalked. Herbs, shrubs, or trees with watery juice. Leaves alternate, simple or digitately compound, sometimes with stipules. Fruit a capsule or berry. (Page 224.)

Fam. 32. **Cruciferæ.** Fls. hermaphrodite, small or of moderate size, in racemes, often corymbose; *sepals 4, petals 4, stamens 6, tetrodynamous.* Herbs with watery juice. Leaves alternate, without stipules. Fruit a narrow 2-valved capsule with 2 parietal placentas or indehiscent. (Page 236.)

Fam. 33. **Tovariaceæ.** Fls. hermaphrodite, small, in racemes; *sepals 7 or 8, petals 7 or 8, stamens 7 or 8.* Shrubby herbs. Leaves alternate, 3-foliate, without stipules. Fruit a berry. (Page 246.)

[Fam. 33A. **Moringaceæ.** Fls. hermaphrodite, showy, of moderate size, irregular; *sepals and petals similar, white tinged with crimson, perigynous; stamens 5, staminodes 5, perigynous.* Trees. Leaves alternate, 2-3-pinnate, without stipules. *Fruit a long 3-valved capsule.]* (Page 247.)

Fam. 34. **Crassulaceæ.** Fls. hermaphrodite, of moderate size, in terminal racemose inflorescences; *calyx campanulate, 4-lobed, corolla subcampanulate, 4-lobed, stamens 8, inserted on corolla.* Herbs, somewhat fleshy. Leaves opposite, imparipinnate or simple. Fruit of 4 follicles with many seeds. (Page 248.)

Fam. 35. **Brunelliaceæ.** Fls. dioecious or polygamous, rather small; *calyx petaloid, petals wanting.* Trees. *Leaves imparipinnate, with very small deciduous stipules.* Fruit of 4 or 5 capsules with 1 or 2 seeds. (Page 249.)

Fam. 36. **Cunoniaceæ.** Fls. hermaphrodite or polygamodioecious, small; *sepals 4, petals 4, stamens 8.* Trees. *Leaves opposite, imparipinnate, with winged rhachis, with stipules.* Capsule small, 2-valved. (Page 251.)

Fam. 37. **Rosaceæ.** Fls. hermaphrodite, *perigynous*, large or small; *sepals 5, petals 5, stamens numerous or few and unilateral,* Herbs, shrubs, or trees. Leaves simple or compound, alternate, with stipules. (Page 253.)

Fam. 38. **Connaraceæ.** Fls. hermaphrodite, small, in panicles; *sepals 5, persistent, petals 5, stamens, 10.* Climbing shrubs. Leaves imparipinnate, alternate, without stipules. *Fruit a solitary follicle.* (Page 265.)

## KEY TO FAMILIES

The perianth is altogether wanting (A); or consists of a single series (a calyx which is sometimes corolla-like) (B); or of a double series (calyx, and corolla of separate petals) with superior ovary (C).

[The figures refer to the number of the family.]

### A. Perianth wanting.

Flowers hermaphrodite: 1.

Flowers unisexual.

Perianth wanting in both male and female flowers.\*

Flowers on globose receptacles with peltate bracts: 8 (*Brosimum*).

Flowers in catkins. Fruit a capsule: 3A.

Flowers in spikes. Fruit a drupe, waxy outside: 4.

Perianth wanting in female flowers only.

Fungus-like fleshy herbs, without chlorophyll, parasitic on roots: 12.

Flowers in strobiles: 6.

Flowers in axillary clusters with large ferruginous bracts, female flower with long filiform persistent style: 9 (*Phenax*).

Flowers in axillary clusters, female flower enclosed by 2 bracts: 15 (*Atriplex*).

Flowers in clusters in spikes, female flower surrounded by the persistent bract and bracteoles: 16 (*Acnida*).

Perianth wanting in male flowers only.

Male flowers in heads surrounded by involucral bracts: 8 (*Pseudolmedia*).

Stipules united into a sheath enclosing the stem: 2.

### B. Perianth of a single series (the calyx, which however is sometimes coloured like a corolla, or the corolla in some *Loranthaceæ*).

Flowers hermaphrodite.

Flowers large, or of moderate size, and showy.

Perianth large, coloured, irregular, tubular, constricted above the ovary, prolonged into a limb: 13.

Perianth large, coloured or white, regular.

Herb: 17 (*Mirabilis*).

Woody climber: 25 (*Clematis*).

\* An inconspicuous perianth occurs in the female flower of 2, and in 8 (*Dorstenia*).

Flowers small.

Parasitic shrubs: 11.

Plants not parasites.

Stipules tubular sheathing the stem: 14.

Stipules wanting or not tubular.

Leaves compound: 35.

Leaves lobed, plant with coloured juice: 30 (*Bocconia*).

Leaves entire or toothed; juice not coloured.

Perianth of distinct unequal segments, more or less covered by imbricated bracts. Flowers in spikes. Trees: 3.

Leaves 3-nerved at base. Fruit small, drupaceous: 7.

Fruit a utricle. Perianth, bract and bracteoles scarious, persistent: 16.

Fruit a utricle. Perianth herbaceous: 15.

Fruit an anthocarp (utricle enclosed in persistent perianth-base): 17 (*Boerhavia*).

Fruit a berry of one carpel or of several carpels, fleshy outside: 18.

Fruit a capsule: 19.

Flowers unisexual.

Leaves compound: 5.

Leaves simple.

Stipules united into a sheath enclosing the stem.

Leaves opposite: 2.

Leaves alternate: 14.

Stipules wanting or not united into a sheath.

Parasitic plants.

Green, parasitic on branches: 11.

Fungus-like, parasitic on roots: 12.

Plants not parasitic.

Submerged water-plants: 24.

Plants not submerged.

Perianth calycine.

Leaves opposite, fleshy, semiterete. Maritime shrub: 6.

Leaves 3-nerved at base. Fruit small, drupaceous: 7.

Trees, shrubs or herbs, with milky juice: 8.

Fruit an achene, sometimes enclosed in the perianth: 9.

Fruit a utricle. Perianth, bract and bracteoles scarious persistent: 16.

Fruit a utricle. Perianth herbaceous, not persistent: 15.

Perianth, bract and bracteoles scarious: 16.

Basal portion of perianth enclosing and adhering to the fruit: 17.

Perianth petaloid. Climbing shrub: 25.

**C.** Perianth of a double series (generally differentiated into calyx, and corolla of separate petals), with superior ovary (but in *Loranthaceae* it is inferior, and in *Portulaca* and *Nymphaea* half-inferior).

Anthers dehiscing by valves.

Perianth inferior, calycine: 28.

Perianth superior, petaloid: 29.

Anthers not dehiscing by valves.

Flowers hermaphrodite.

Leaves simple.

Leaves opposite.

Parasitic plants: 11.

Plants not parasites.

Perianth petaloid (involucre simulating a calyx) with basal portion enclosing and adhering to fruit: 17 (*Mirabilis*).

Sepals 2. Fruit a capsule: 20.

Sepals 5. Fruit a capsule: 22.

Calyx 4-lobed. Fruit 4 follicles: 34.

Leaves alternate.

Aquatic plants with peltate leaves: 23.

Leaves lobed (in *Cruciferae* sometimes simulating a compound leaf).

Stamens numerous.

Fruit a head of achenes: 25.

Fruit a capsule: 30.

Stamens 6, tetrodynamous: 32.

Leaves entire.

Fruit a drupe.

Leaves without stipules: 10.

Leaves with stipules: 37.

Fruit not drupaceous.

Stipules ochreate: 14 (*Rumex*).

Stipules not ochreate.

Calyx-segments 5, enlarged in fruit: 18 (*Stegnosperma*).

Sepals 2. Fruit a capsule: 20.

Sepals 2. Fruit a utricle enclosed in the perianth: 21.

Sepals 3: 27.

Sepals 4: 31.

Leaves compound.

Leaves digitate.

Sepals 4: 31.

Sepals 7 or 8: 33.

Leaves pinnate.

Rhachis winged: 36.

Rhachis not winged.

Leaves 2-3 pinnate: 33A.

Leaves simply pinnate.

Fruit a head of achenes: 25.

Fruit 4 follicles: 34.

Fruit-achenes on or enclosed in the receptacle: 37.

Fruit a solitary follicle: 38.

Flowers unisexual.

Parasitic shrubs: 11.

Plants not parasites.

Leaves simple: 26.

Leaves compound: 36.

## CORRECTIONS

Page 9, line 20, for *P. obtusifolium* read *P. obtusifolia*.  
,, 40, line 3, for *T. Lamarckianum* read *T. Lamarckiana*.  
,, 51, ,, 6, for *Bot.* read *Bat.*.  
,, 124, ,, 8, for *Gen.* read *Gew.*.  
,, 176, ,, 6 from bottom, for *Mitt.* read *Nutt.*.  
,, 216, ,, 1, for *U.* read *N.*.  
,, 217, ,, 7, for *Litt.* read *Lit.*

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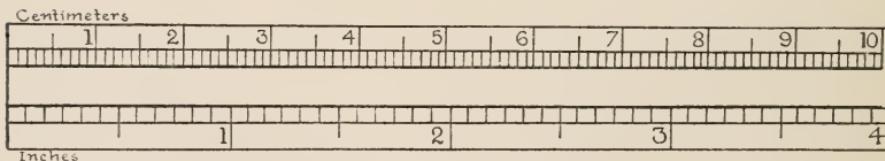
### NOTE ON *CAPPARIS LONGIFOLIA* Sw. (pages 230, 232).

We have lately received excellent material of *Capparis cynophallophora* L. from Mr. J. R. Bovell, Superintendent of Agriculture, Barbados.

The form of the leaf varies, even on one and the same branch, from narrow-linear to elliptical, and includes a form identical with the leaf of the specimen in Plukenet's Herbarium on which Swartz founded his *C. longifolia*. This name is therefore a synonym of *C. cynophallophora* L.

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For the convenience of workers a comparative scale showing centimeters and inches is given below.



# DICOTYLEDONS

## FAMILY I. PIPERACEÆ.

HERBS, shrubs, or rarely trees. Leaves alternate, opposite or whorled, without stipules in the Jamaican species, entire (very rarely 3-lobed), palmi- or pinni-nerved, sometimes glandular-dotted, sometimes succulent. Flowers hermaphrodite, without a perianth, in spikes which are sometimes fleshy, stalked, terminal or opposite the leaves, or more rarely axillary or several together on a common peduncle; flowers small to minute, densely or sparsely arranged in whorls or spirals; bracts sessile or stalked, sometimes peltate. Stamens 2-6, rarely more, hypogynous; anthers with two distinct cells, which are sometimes confluent, with longitudinal dehiscence. Ovary sessile or rarely stalked, unilocular, with 1 ovule; stigmas 3 to 4 or solitary; ovule orthotropous. Fruit a small berry; seed containing a small embryo and both perisperm and endosperm. Vascular bundles of the stem arranged in two or more rings.

Species more than 1,300, widely distributed in the tropics of the whole world, sometimes subtropical.

Herbs.....	1. <i>Peperomia</i> .
Shrubs or trees.....	2. <i>Piper</i> .

### 1. PEPEROMIA Ruiz & Pav.

Herbs, annual or perennial, often prostrate, with thin or succulent stems. Leaves succulent or thinly membranous, generally with pellucid dots. Flowers sometimes slightly sunk in pits in the rhachis. Spikes solitary or 2 or panicle, terminal, or solitary axillary or opposite the leaves. Bracts round or elliptical, sessile under each flower. Stamens 2. Ovary sessile or sometimes stalked, apex obtuse, acute or beaked; stigma terminal or lateral below the beak. Berry minute, ellipsoidal to globose, sessile or stalked, verruculose or smooth, viscid, with a

short style and terminal stigma or with an obliquely-placed apical appendage (consisting of a shield-like base, with the stigma subcentral), only slightly produced above the berry or elongated into a beak; sometimes smooth above with a viscid pseudocupule round the lower half.

Species over 600, widely distributed through the warmer regions of the globe, but mainly in America, extending from Florida and Mexico to Argentina and Chile.

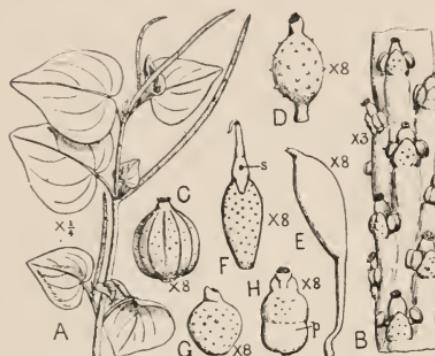


Fig. 1.—*Peperomia*.

A, Shoot bearing flower-spikes of *P. pellucida* Kunth.  
 B, Portion of flower-spike of same.  
 C, Fruit of same.  
 D, Fruit of *P. hispidula* A. Dietr.  
 E, Fruit of *P. tenella* A. Dietr.  
 F, Fruit of *P. obtusifolia* A. Dietr. ;  
     s, stigma.  
 G, Fruit of *P. dendrophila* Schlechtend.  
 H, Fruit of *P. septemnervis* Ruiz & Pav. ; p, pseudocupule.

I. Leaves alternate (occasionally opposite in *P. rotundifolia* and the lower leaves of *P. alpina*).

A. Leaves not more than 2·5 cm. (1 inch) long.

1. Leaves roundish or elliptical or obovate.

Leaves with a few white hairs on upper surface. Spikes filiform.....  
 Leaves hispid on both sides. Spikes fleshy.....  
 Leaves puberulous on both sides. Spikes fleshy.....  
 Leaves obcordate, puberulous on upper surface.....  
 Leaves minute, 3-4 mm. l., generally with a few hairs on both surfaces and margin. Spikes fleshy.....

1. *P. hispidula*.  
 17. *P. rotundifolia*.  
 38. *P. Fawcettii*.  
 18. *P. cordifolia*.  
 4. *P. emarginella*.  
 3. *P. tenella*.

2. Leaves lanceolate or ovate-lanceolate.....

3. Leaves deltoid or deltoid-roundish.

Spikes not fleshy, lax-flowered.....  
 Spikes fleshy, dense-flowered.....

2. *P. pellucida*.  
 16. *P. serpens*.

B. Leaves more than 2·5 cm. long.

1. Leaves thick and fleshy, broadest above middle, obovate to oblanceolate, blade more or less decurrent into petiole.

Spike (in fr.) with acuminate pits of which edges form a woody network; bracts 5-1 mm. br., 2-4 visible about same level, distant; beak of berry curved but not hooked, stout, as long as berry.

Leaves roundish-elliptical, long-stalked, 3-4.5 cm. l.; bracts .75-1 mm. br., 2-3 visible about same level ..... 7. *P. alpina*.

Leaves obovate-elliptical, base long-cuneate and passing into and decurrent on the stalk, 4.5-12 cm. l.; bracts .5-.75 mm. br., 3-4 visible about same level ..... 8. *P. crassicaulis*.

Spike (in fr.) with ovoid pits not completely touching; bracts .4-.6 mm. br., 3-7 visible about same level, touching or overlapping in close whorls; beak of berry curved or straight, but not hooked, shorter than the berry.

Leaves sessile, linear-oblanceolate to obovate; bracts 6-7 visible about same level; beak very short,  $\frac{1}{5}$ - $\frac{1}{6}$  length of berry ..... 9. *P. amplexicaulis*.

Leaves sessile, sometimes narrowing into a stalk-like base, oblanceolate, obovate or oblong-obovate; bracts 4-5 visible about same level; beak  $\frac{1}{3}$ - $\frac{1}{2}$  length of berry ..... 10. *P. clusiifolia*.

Leaves roundish narrowing into a winged stalk or obovate, sessile; bracts 5-7 visible about same level; beak  $\frac{1}{2}$  length of berry ..... 11. *P. magnoliifolia*.

Spike (in fr.) with spherical pits touching; bracts .3-.4 mm. br., 6-8 visible about same level, touching in close whorls; beak straight, hooked at tip ..... 12. *P. obtusifolia*.

2. Leaves broadest below middle and ovate-elliptical or ovate-roundish, or broadest about middle, lanceolate.

i. Leaves more or less peltate, somewhat leathery.

Leaves large, 12-20 cm. l., peltate just above base ..... 14. *P. maculosa*.

Leaves smaller, 5-9 cm. l.

Leaves peltate at  $\frac{1}{3}$ - $\frac{1}{4}$  of their length from base ..... 13. *P. hernandiifolia*.

Leaves scarcely peltate ..... 15. *P. distachya*.

ii. Leaves not peltate.

Leaves decurrent forming wings or ribs on the stem.

Plant covered with black dots ..... 23. *P. glabella*.

Plant glabrous, without black dots or with a few on lower surface of leaves.

Leaves 4.5-7 cm. l., elliptical-lanceolate, acuminate ..... 20. *P. alata*.

Leaves 3-7 cm. l., broadly elliptical ..... 21. *P. dendrophila*.

Leaves 2-3.5 cm. l., elliptical, very shortly stalked ..... 22. *P. Hamiltoniana*.

Leaves not decurrent.  
 Spikes about as long as leaves.  
 Spikes thick ..... 5. *P. basellifolia*.  
 Spikes slender ..... 6. *P. talinifolia*.  
 Spikes 2 or 3 times as long as leaves,  
 slender.  
 Leaves narrowly oblong ..... 19. *P. Harrisii*.  
 Leaves elliptical ..... 24. *P. guadaloupensis*.

II. Leaves opposite or in whorls of 3, 4 or 5.

A. Leaves generally opposite, but sometimes  
 whorled.

1. Leaves large, more than 2.5 cm. l., lan-  
 ceolate.  
 Spikes thick and fleshy. Leaves  
 7-5-nerved ..... 35. *P. septemnervis*.  
 Spikes thin. Leaves 3-nerved.  
 Margin of leaves not ciliate ..... 28. *P. stellata*.  
 Margin of leaves ciliate ..... 29. *P. blanda*.  
 2. Leaves small, less than 2.5 cm. l.  
 Leaves round and, with stem, densely  
 villose ..... 30. *P. barbata*.  
 Leaves linear or obovate-oblong ..... 25. *P. filiformis*.

B. Leaves 3 in a whorl, elliptical. Stem  
 hispidulous. Spike filiform, thin ..... 37. *P. discolor*.

C. Leaves 3-5 in a whorl.

Leaves obovate, emarginate, glabrous.  
 Spikes fleshy ..... 34. *P. quadrifolia*.

Leaves not emarginate.

Rhachis hirtellous. Leaves roundish or  
 rhomboid-elliptical ..... 33. *P. reflexa*.

Rhachis not hirtellous.

Spikes somewhat fleshy.

Leaves lanceolate, or elliptical-lan-  
 ceolate, indistinctly 3-nerved ... 31. *P. Myrtillus*.

Leaves obovate-subrhomboid ..... 32. *P. polystachya*.

Spikes thin.

Leaves 5-2 cm. l.

Leaves with brownish dots under-  
 neath ..... 26. *P. galoides*.

Leaves without brownish dots ... 27. *P. verticillata*.

Leaves 2-5 cm. l.

Leaves opposite or 3-5 in a whorl.

Margin of leaves not ciliate ... 28. *P. stellata*.

Margin of leaves ciliate ..... 29. *P. blanda*.

Leaves 4 in a whorl ..... 36. *P. rhomboides*.

§ 1. Berries stalked, setose, mucronate, with stigma terminal.  
 Leaves alternate.

1. *P. hispidula* A. Dietr. *Sp. Pl. i.* 165 (1831); leaves  
 roundish, with a few hairs above; spikes filiform, not fleshy,  
 lax-flowered, bracts inconspicuous; berries stalked, stalk nearly  
 as long as berry.—*Griseb. Fl. Br. W. Ind.* 165; *C. DC. in Symb.*  
*Ant. iii.* 223; var. *Swartziana Dahlst. Stud.* 13, *t. I. f. 3* (1900).  
*Piper hispidulum Sw. Prodr.* 15 (1788), *Fl. Ind. Occ.* 63 & *Icon.*

t. 4. *Acrocarpidium hispidulum* *Miq. Syst. Pip.* 54 (1843). (Fig. 1, D.)

In damp peaty soil in shady woods; Blue Mts., *Swartz!* Newhaven Gap, 5600 ft.; Blue Mt. Peak, 7400 ft.; Morse's Gap, 4800-5000 ft.; *Harris!* Fl. Jam. 6728, 7548, 7970, 8320.—Costa Rica, Colombia, Venezuela, Brazil, Ecuador, Argentina, Paraguay.

Stems erect, sometimes decumbent and rooting below, hispidulous at the nodes, 4-8 cm. l. Leaves thinly membranous, 4-12 mm. l. and br.; stalk 2-3 mm. l. Spikes 7-10 mm. l.; peduncles 3-5 mm. l. Berries ellipsoidal, 7-8 mm. l.; mucro 15-2 mm. l.; stalk 5 mm. l.

§ 2. Berries sessile, subglobose, with several longitudinal verruculose ribs, mucronate, with stigma terminal. Leaves alternate.

2. *P. pellucida* *Kunth in H. B. & K. Nov. Gen. & Sp. i.* 64 (1816); glabrous; leaves subcordate-deltoid; spikes filiform, not fleshy, lax-flowered.—*Haw. Succ.* 6; *Miq. op. cit.* 79; *Griseb. loc. cit.*; *C. DC. tom. cit.* 244 & *iv.* 189; *Dahlst. op. cit.* 16, *t. I. f. 1.* *P. concinna* *A. Dietr. tom. cit.* 164 (1831). *Saururus minor procumbens* &c. *Plum. Descr. Pl. Amer.* 54, *t. 72* & *Ic. ined. iv. t. 239.* *Piper pellucidum* *L. Sp. Pl.* 30 (1753). *P. concinnum* *Haw. Succ. Rev.* 198 (1821). (Fig. 1, A-C.)

In damp shady soil; *Swartz* in *Herb. Stockh.*! *J.P.* 713, *Morris!* *Hope*, 700 ft.; *Harris!* Fl. Jam. 6251, 8352; *Bath, G. Nichols!* *Port Antonio, Millspaugh.*—Porto Rico, St. Thomas, St. Cruz, St. Bartholomew, Guadeloupe, Dominica, Martinique, St. Vincent, Barbados, Grenada, Tobago, Trinidad, trop. America to Peru, W. Africa.

Stems 1-3 dm. high, erect, branching, with rather long internodes. Leaves thinly membranous, pellucid, 1.5-2.5 cm. l. and br.; stalk 5-1 cm. l. Spikes 2-5 cm. l.; bracts 4 mm. br.; peduncles usually about 5 cm. l. Berries 9-1 mm. l.

§ 3. Berries stalked, obovate to oblong, smooth, at the apex with a conical-curved or discoid appendage, with the stigma just below the apex. Leaves alternate.

3. *P. tenella* *A. Dietr. tom. cit.* 153 (1831); leaves ovate to ovate-lanceolate, glabrous but sometimes ciliate near apex; spikes filiform, slightly swollen, lax-flowered; berries stalked, stalk about as long as berry.—*Griseb. loc. cit.*; *C. DC. in Urb. Symb. Ant.* iii. 224; *Dahlst. op. cit.* 21, *t. IV. f. 5.* *Piper tenellum* *Sw. Prodr.* 16 (1788), *Fl. Ind. Oce.* 65 & *Ic. ined. t. 31.* *Acrocarpidium tenellum* *Miq. op. cit.* 53 (1843). (Fig. 1, E.)

Amongst mosses on trees; Blue Mts., *Swartz!* *Wiles!* *Bertero!* *Wilson!* *March!* *Catherine's Peak, Eggers!* *Cinchona*, 5000 ft., *Watt!* road to John Crow Peak, 5400 ft.; Morse's Gap, 5000 ft.; *Harris!* Fl. Jam. 8323, 8335; John Crow Peak, *G. Nichols!*—Cuba, Guadeloupe, Venezuela, Brazil.

Stem creeping and rooting at nodes; flowering branches erect or ascending, below leafless, 3-12 cm. high. Leaves pellucid-dotted, 8-17 mm. l., 4-10 mm. br.; stalk 1-1.5 mm. l. Spikes 2-4 cm. l., 5-9 mm. br.;

peduncles 5-1 cm. l.; bracts 5-7 mm. br. *Berries* 1.5 mm. l., narrowly obovate, 2-ribbed, mucronate with the apical appendage which is thick and discoid at base and conical-curved above; stigma terminal.

4. *P. emarginella* C. DC. in DC. Prodr. xvi. pt. 1, 437 (1869); leaves minute, long-stalked, roundish, truncate or emarginulate at apex, sometimes slightly cordate at base, with a few long hairs; spikes slightly fleshy, somewhat lax-flowered; berries stalked, stalk nearly half as long as berry.—C. DC. in Urb. Symb. Ant. iii. 225 & iv. 187; Hensch. Étud. 23, t. I. f. 6; Dahlst. op. cit. 22, t. I. f. 4, t. IV. f. 4. *P. exilis* Griseb. op. cit. 164 (1859); C. DC. in DC. Prodr. xvi. pt. 1, 397. *P. minima* C. DC. tom. cit. 399. *Piper emarginellum* Sw. in Vet. Handl. Stockh. 1827, 56 (1828). *Aerocarpidium exile* Miq. op. cit. 56 (1843). Type in Herb. Stockholm.

On trees; Blue Mts., Swartz! Wilson.—Cuba, Porto Rico, Guadeloupe, Dominica, Martinique, St. Vincent, Trinidad. In Swartz's Herbarium in Stockholm there is a specimen labelled "In Jamaicæ montibus cœruleis: O. Swartz!" Dahlstedt records a specimen (No. 626) from Wilson in Herb. Grisebach, but, so far as we know, it has not been collected in recent years.

Stems clustered, creeping, much branched, glabrous. Leaves 3-4 mm. l., 4-5 mm. br.; stalks 2-3 mm. l. Spikes about 1 cm. l., 6-8 mm. br.; peduncles longer than the petioles; bracts 4 mm. br. Berries slightly verruculose, obovate-oblong, apical appendage subdiscoid, oblique, 7-8 mm. l.; stalk 3 mm. l.

§ 4. Berries sessile, oblong-ellipsoidal broadening slightly above, verruculose, apical appendage small, flat, somewhat oblique, with stigma subcentral. Leaves alternate.

5. *P. basellifolia* Kunth tom. cit. 66 (1816); glabrous; leaves lanceolate to obovate-lanceolate, apex long-acuminate and sometimes curved, at the base cuneate and decurrent into the petiole, leathery-membranous; spikes solitary, terminal, about as long as the leaves, thick, dense-flowered.—C. DC. in DC. Prodr. xvi. pt. 1, 406; Dahlst. op. cit. 48, t. I. f. 33.

In peaty soil in shady woodland; Morse's Gap, 5000 ft.; near Vinegar Hill, 4200 ft.; Harris! Fl. Jam. 8318, 8332; John Crow Peak, G. Nichols!—Venezuela, Colombia, Peru.

Stem succulent, erect from a procumbent base, simple, sometimes branching, 2-4 dm. high, 3-7 mm. br., bare of leaves below, rooting near base. Leaves variable in size, limb 5-10 cm. l., 1.5-3.75 cm. br.; petioles 5-1.5 cm. l. Spikes 5.5-7.5 cm. l., 3-4 mm. br.; peduncles 3-4 cm. l.; bracts 4-5 mm. br.; 6-8 about the same level on one side. Berries 8-9 mm. l.

6. *P. talinifolia* Kunth tom. cit. 62 (1816); glabrous; leaves elliptical, attenuated to base, and slightly to obtuse apex, decurrent into very short petiole, leathery-membranous, with 3 or more indistinct nerves on each side; spikes solitary or 2 or 3,

terminal and axillary, about as long as, sometimes longer than, the leaves, somewhat slender, dense-flowered.—*Griseb. op. cit.* 167; *C. DC. in Urb. Symb. Ant.* iii. 252.

On trunks of trees; near Mabess River, 4000 ft., *Harris!* Fl. Jam. 8338. *Stem* succulent, rooting at nodes below, 1·5-3 dm. high, 3 mm. br. *Leaves* 7-10 cm. l., nearly 3 to nearly 4 cm. br. *Spikes* to 10 cm. l., 2 mm. br. (in flower); peduncles 1·5 cm. l.; bracts .6 mm. l., .5 mm. br., 4 about the same level on one side. *Berries* not seen.

§ 5. Berries sessile, verruculose, ellipsoidal to cylindrical-oblong; apical appendage consisting of an oblique "shield," produced posteriorly into a long beak, with the stigma subcentral. Leaves alternate.

A. Leaves more or less decurrent, not peltate.

7. *P. alpina* *A. Dietr. tom. cit.* 185 (1831); leaves somewhat leathery, long-stalked, roundish-elliptical, apex rounded or obtuse, base shortly cuneate; spikes somewhat lax-flowered (in fr.) with acuminate pits of which the edges form a woody network; style of ovaries oblong, linear-acuminate; bracts .75-1 mm. br., round, 2-3 about the same level on one side; berries with beak of apical appendage curved but not hooked, stout, as long as the berry.—*Miq. op. cit.* 168; *Griseb. op. cit.* 167; *Dahlst. op. cit.* 58; *C. DC. in Urb. Symb. Ant.* iii. 257. *Piper alpinum* *Sw. Prodr.* 15 (1788) & *Fl. Ind. Occ.* 62. Type in Herb. Stockholm.

In peaty soil or on decaying trunks of trees; Blue Mts., *Swartz!* Blue Mts., *McNab!* near Morse's Gap, 5000 ft.; Greenwich, 4500 ft.; *Harris!* Fl. Jam. 8316, 10,140 (in part).

*Stem* creeping below, then ascending to erect, simple or with two branches, 12-25 cm. l. *Leaves* 2-3 pinnate principal nerves on each side, the younger leaves somewhat puberulous, the lower sometimes opposite, 3-5·5 cm. l., 2·25-4 cm. br.; stalk 1-3 cm. l. *Spikes*, two terminal or solitary in axils, rhachis 3-6 cm. l., 1·5-2 mm. br.; peduncles 1·5-2·5 cm. l. *Berries* 1-1·25 mm. l., ellipsoidal.

8. *P. crassicaulis* *Fawc. & Rendle in Journ. Bot. l.* 177 (1912); stem thick; leaves leathery, obovate-elliptical, apex obtuse, sometimes slightly emarginate, base cuneate and passing into and decurrent on the petiole, median nerve prominent below and forming a narrow wing or rib on the petiole; spikes somewhat lax-flowered, in the fruiting stage with elliptical pits of which the edges form a woody network; style of ovaries lanceolate-acuminate; bracts .5-.75 mm. br., elliptical or round, 3-4 about the same level on one side; berries with beak of apical appendage subulate, curved but not hooked, as long as the berry.—*P. obtusifolia* *Griseb. op. cit.* 166 (in part), non *A. Dietr.* Type in Herb. Mus. Brit. and in Herb. Jam.

In peat in shady woodland and on decaying trunks of trees; *Macfadyen!* Blue Mts. *McNab!* John Crow Peak, J.P. 1481, *Hart!* Morse's Gap,

4900-5000 ft.; Greenwich, 4500 ft.; *Harris!* Fl. Jam. 8104, 8321, 10,140 (in part); Morse's Gap, *G. Nichols!*—Bermuda, Cuba.

Stem rooting below, erect, simple or with two or three branches, to 7 dm. l., to 8 mm. br. Leaves 4-8 pinnate principal nerves on each side, one or two lower pairs springing from near base, apex sometimes slightly puberulous, blade 4-12 cm. l., 2-5 cm. br.; stalk to 3 cm. l. Spikes terminal, geminate to paniculate, rhachis 7-16 cm. l., 2.5-3 mm. br., common peduncle 4-8.5 cm. l.; peduncles 2-4 cm. l. Berries 1-1.25 mm. l., ellipsoidal.

9. *P. amplexicaulis* A. Dietr. *tom. cit.* 144 (1831); leaves leathery, sessile, linear-oblanceolate to obovate, apex obtuse, tapering to a very narrow base attached to a projecting horseshoe-shaped leaf-trace; spikes dense-flowered, in close whorls (in fr.), with ovoid pits not completely touching; style of ovaries lanceolate-acuminate; bracts .5 mm. br., 6-7 about the same level on one side, touching or overlapping; berries with beak of apical appendage straight, very short ( $\frac{1}{5}$ - $\frac{1}{6}$  length of berry).—*Miq. op. cit.* 196; *Griseb. op. cit.* 166 (in part); *Dahlst. op. cit.* 63, *t. II. f. 7*; *C. DC. tom. cit.* 258. *Piper amplexicaule* Sw. *Prodri.* 16 (1788), *Fl. Ind. Occ.* 17 & *Ic. ined. t.* 56. Type in Herb. Stockholm.

On rocks; *Swartz!* *Masson!* *Macfadyen!* *Moneague, Prior!* *Money Corner, 800 ft., Thompson!* near Troy, 2200 ft., *Harris!* Fl. Jam. 8067, 8889; hills near Bulstrode, *Mrs. Britton, 2881!* Bath, 300 ft., *G. Nichols!*

Stem thick, rooting below, erect, branching from base, 10-20 cm. l., to 5 mm. br. Leaves 3-5 pinnate nerves on each side, the two lower pairs springing from near the base, 7-15 cm. l., 1.5-3.5 cm. br. Spikes terminal paniculate and sometimes one or two in upper axils; rhachis 5-18 cm. l., 2 mm. br.; common peduncle including branches about 3 cm. l.; peduncle, terminal 2-2.5 cm. l., axillary to 3 cm. l. Berries 1 mm. l., ellipsoidal, surface obscurely reticulate, beak .2-.4 mm. l.

10. *P. clusiifolia* Hook. *Bot. Mag. t.* 2943 (1829); leaves leathery, sessile or passing into and decurrent on the petiole, oblanceolate, obovate or oblong-obovate, apex rounded to obtuse, sometimes slightly emarginate, tapering to a very narrow base attached to a projecting horseshoe-shaped leaf-trace; spikes dense-flowered in close whorls, (in fr.) with ovoid pits not completely touching; style of ovaries acute; bracts .5-.6 mm. br., 4-5 on same level on one side; berries with beak of apical appendage curved,  $\frac{1}{3}$ - $\frac{1}{2}$  length of berry.—*Dahlst. op. cit.* 62; *C. DC. tom. cit.* 257. *P. cuneifolia* A. Dietr. *tom. cit.* 146 (1831); *Miq. op. cit.* 194; *Dahlst. op. cit.* 63, *t. II. 6*; *C. DC. tom. cit.* 258. *P. obtusifolia* *Griseb. op. cit.* 166 (in part). *P. amplexicaulis* var. *Swartziana* *Griseb. op. cit.* 166. *Piper clusiifolium* *Jacq. Collect. iii.* 209 (1789) & *Ic. Pl. Rar. ii. t.* 212; *Haw. Succ.* 5. *P. cuneifolium* *Jacq. Collect. iv.* 127 (1790) & *Ic. Pl. Rar. ii. t.* 214.

In peaty soil, on trees, and in crevices of rocks; *Broughton!* *Purdie!* *Wullschaegel*; Banana River, 1700 ft., *Eggers*; Bryans Hill, 3000-3500 ft.;

Guava Ridge Road, 1200 ft.; coast between Portland Point and Rocky Point; *Harris!* Fl. Jam. 8359, 10,184; Belvedere, Hanover, *Mrs. Britton*, 2865! Bath, 300 ft.; *G. Nichols!*

*Stem* thick, rooting below, erect or decumbent at base, 10-30 cm. l., to 5 mm. br. *Leaves* 3-5 pinnate nerves on each side, one or two lower pairs springing from near the base, 5-15 cm. l., 2.5-5(-8) cm. br. *Spikes* solitary, geminate, or 3-paniculate, terminal and in upper axils; rhachis 10-19 cm. l., 2-2.5 mm. br., common peduncle about 2 cm. l.; peduncle (terminal), 1-2 cm. l. (when solitary), to 5.5 cm. l. *Berries* 8 mm. l., beak 3-4 mm. l.

11. *P. magnoliifolia* A. Dietr. *tom. cit.* 153 (1831); leaves leathery, very variable, roundish-elliptical or elliptical, narrowing abruptly and passing into and decurrent on the petiole or obovate or elliptical-cuneate, sessile, attached on the older branches to a projecting horseshoe-shaped leaf-trace, apex rounded or obtuse; spikes dense-flowered in close whorls, (in fr.) with ovoid pits not completely touching; style of ovaries acute; bracts 4-5 mm. br., 5-7 on same level on one side; berries with beak of apical appendage half length of berry.—*Dahlst. op. cit.* 58, *t. II. f.* 1-5 (in part). *P. obtusifolium* Griseb. *Fl. Br. W. Ind.* 166 (1859) (in part); *C. DC. tom. cit.* 254 (in part) & *iv.* 191, non *A. Dietr.* *P. amplexicaulis* var. *magnoliifolia* Griseb. *op. cit.* 167. *Piper magnoliæfolium* Jacq. *Collect. iii.* 210 (1789) & *Ic. Pl. Rar. t.* 213. *P. obtusifolium* Ehret in *Trew Pl. Select. t.* 96.

*Houston!* *Lane!* *March!*—Cuba, Hispaniola, Porto Rico, Dominica, Martinique, St. Vincent, tropical South America.

*Stem* thick, erect, 4 mm. br. *Leaves* with three or four indistinct pinnate nerves on each side, one or two lower pairs springing from near the base, 6-13 cm. l., 4-7 cm. br. *Spikes* solitary, geminate or paniculate, terminal (solitary in upper axils); rhachis 10-14 cm. l., 1.5-2 mm. br.; peduncle 2-3 cm. l. *Berries* 7-8 mm. l.

12. *P. obtusifolia* A. Dietr. *tom. cit.* 154 (1831); leaves leathery, elliptical, narrowing abruptly and passing into and decurrent on the petiole, apex rounded, sometimes slightly retuse or emarginate; spikes dense-flowered in close whorls, (in fr.) with spherical pits touching (like a honey-comb); bracts 3-4 mm. br., 6-8 on same level on one side; berries with beak of apical appendage straight with short hook at tip,  $\frac{2}{3}$  length of berry.—*Dahlst. op. cit.* 64, *t. II. f.* 10; *C. DC. tom. cit.* 254 (in part) & *iv.* 190. *Saururus humilis* folio &c. *Plum. Deser. Pl. Amer.* 53, *t. 70* & *Ic. ined. iv.* 241. *Piper obtusifolium* L. *Sp. Pl.* 30 (1753). (Fig. 1, F.)

*March* (fide *Dahlst.*)—Florida, Cuba, Hispaniola, Porto Rico, Martinique, St. Lucia, Trinidad, Brazil, Venezuela, Colombia, Surinam, Mexico, Nicaragua, Guatemala.

*Stem* erect or decumbent, rooting at the nodes at the base, simple or branching. *Leaves* with 3-5 indistinct pinnate nerves on each side, one

or two lower pairs springing from near the base; limb 4·5-8 cm. l., 3·5-4·8 cm. br.; stalks 5-2 cm. l. *Spikes* solitary or geminate, terminal; rhachis 5-10 cm. l., 2-3 mm. br.; common peduncle 3·5-5 cm. l., peduncles 2-4 cm. l. *Berries* ellipsoidal-cylindrical, ·9 mm. l., beak ·6 mm. l.

### B. Leaves peltate.

13. *P. hernandiifolia* A. Dietr. *tom. cit.* 157 (1831); leaves peltate at  $\frac{1}{3}$  to  $\frac{1}{4}$  of their length from the base, large, 6-8 cm. l., ovate, long-stalked, minutely puberulous beneath, especially along the central nerve; spikes solitary.—*Griseb. op. cit.* 166; *Dahlst. op. cit.* 71, *t. II.* 14; *C. DC. in Urb. Symb. Ant.* *iii.* 246 & *iv.* 189. *P. Ponthieui* *Miq. op. cit.* 186 (1843). *Piper hernandiifolium* *Vahl Enum. i.* 344 (1804).

On trees and trailing on steep slopes in the shade; *Swartz!* *Caley!* *March*; Greenwich Wood, Blue Mts.; near Mabess River, 3800 ft.; near Hardware Gap, 4000 ft.; *Harris!* *Fl. Jam.* 8339, 10119.—Cuba, Porto Rico, Saba, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada, Costa Rica, Venezuela, Brazil.

*Stem* creeping and rooting at nodes, minutely puberulous. *Leaves* ovate or broadly ovate, rounded at the base, apex abruptly acuminate, acute, 4-5·5 cm. br.; stalk minutely puberulous, 5-9 cm. l. *Spikes* on branches which are terminal, axillary or sometimes opposite a leaf; rhachis dense-flowered, 2·5-4 cm. l., 2 mm. br.; bracts small, ·3 mm. br., 5-6 on same level on one side; peduncle minutely puberulous, including the branch longer than the petiole. *Berries* ·8-·9 mm. l., ellipsoidal or slightly ovate-ellipsoidal; apical appendage slightly curved, ·6-·7 mm. l.

14. *P. maculosa* Hook. *Exot. Fl. t. 92* (1825); leaves peltate a little above the base, large, 12-20 cm. l., ovate to ovate-elliptical, long-stalked, pubescent underneath; spikes 2 terminal.—*Dahlst. op. cit.* 71, *t. II.* 15; *C. DC. in Urb. Symb. Ant.* *iii.* 245 & *iv.* 189. *Saururus hederaceus* &c. *Plum. Descr. Pl. Amer.* 50, *t. 66*. *Piper maculosum* L. *Sp. Pl.* 30 (1753).

In rocky woodland; Abbey Green, 3800 ft.; *Harris!* *Fl. Jam.* 6430, 8312.—Cuba, Hispaniola, Porto Rico.

*Stem* sparingly pubescent, rooting below, succulent, 5 mm. thick, of light green colour, mottled with brownish-crimson blotches. *Leaves*, base rounded or subcordate, apex shortly and acutely cuspidate, blade 8-11 cm. br., pinnate-nerved, upper surface dark shining green with whitish nerves, under surface greenish-white; stalks 5-18 cm. l., like the stem, pubescent. *Spikes*, each with an ovate acute bract at the base; rhachis fleshy, dense-flowered, 1·5-3 dm. l., 5 mm. br. below; bracts ·6-·8 mm. br., round or somewhat elliptical, 5-7 about the same level on one side; peduncles 3-4·5 cm. l. *Berries* 1 mm. l., roundish-ellipsoidal; apical appendage elliptical with stigma subcentral, beak nearly as long as berry.

*P. variegata* Ruiz & Pav. *Fl. Per. i.* 33, *t. 52, a.* (1798); the type specimen from Peru in *Herb. Mus. Brit.* is glabrous, but otherwise agrees with *P. maculosa*.

15. *P. distachya* A. Dietr. *tom. cit.* 156 (1831); leaves generally very shortly peltate, somewhat large, 4·5-9 cm. l., ovate or

elliptical, long-stalked, younger leaves puberulous underneath, especially at base and apex and along median nerve; spikes 2 terminal.—*Griseb. op. cit.* 166; *C. DC. in Urb. Symb. Aut. iii.* 251 & *iv.* 190, non *Dahlst.* *P. producta* *Griseb. op. cit.* 166 (1859); *Dahlst. op. cit.* 72, *t. II.* 16. *Saururus hederaceus* &c. *Plum. op. cit.* 51, *t. 67*. *Piper distachyon L. Sp. Pl.* 30 (1753); *Sw. Obs. Bot.* 21.

On trees and rocks; *Swartz!* *Macfadyen!* *Nock!* *J.P.* 1251, *Morris!* *Colthirst River*; *Whitfield Hall* woodland, 4000 ft.; *Cinchona*; *Harris!* *Fl. Jam.* 5635, 8346; *Union Hill*, near *Moneague*, *Britton & Hollick*, 2727! *Mabess River*, 2000 ft., *G. Nichols!*

*Stem* climbing or creeping and rooting at nodes, glabrous or sparingly puberulous. *Leaves* roundish or obtuse and sometimes emarginate at base, apex acuminate, acute, 3-5 cm. br.; stalk puberulous towards apex, 3-9 cm. l. *Spikes*, rhachis fleshy, dense-flowered, 3-4 cm. l., 1.2-1.5 mm. br.; bracts small, 3-4 mm. br., 4 about same level on one side; spike-bearing branches 1.5-3 cm. l.; peduncles 5-2 cm. l. *Berries* 8 mm. l., narrowly ellipsoidal; beak subulate, slightly curved, nearly as long as berry.

*Dahlstedt* identifies *P. distachyon L.* with a Brazilian species, but as *Plumier* states that he collected his plant in S. Domingo, we agree with *C. de Candolle* that *Linnæus's* species, which was founded on *Plumier's*, is the West Indian one.

### C. Leaves with petiole attached at margin.

16. *P. serpens* *Loud. Hort. Brit.* 13 (1830), (non *C. DC.*); leaves deltoid-roundish, puberulous; spikes fleshy, somewhat dense-flowered.—*Griseb. op. cit.* 164. *P. scandens* *Ruiz & Pav. Fl. Per. i.* 32, *t. 51, b.* (1798); *C. DC. tom. cit.* 248 & *iv.* 190. *P. repens* *Kunth tom. cit.* 65 (1816); *Griseb. op. cit.* 165; *Dahlst. op. cit.* 79, *t. II.* 18-20. *P. reniformis* *Hook. Exot. Fl. t.* 164 (1825). *Piper longum minimum* &c. *Sloane Cat.* 45 & *Hist. i.* 137. *Piper serpens* *Sw. Prodr.* 16 (1788) & *Fl. Ind. Occ.* 69. *P. bracteatum* *Thomps. in Trans. Linn. Soc. ix.* 203, *t. 21, f. 2* (1808).

On trees, rocks and walls; “between Guanaboa and Col. Bourden's plantation” *Sloane Herb. ii.* 90! *Swartz!* near Louisburg, St. Mary, *McNab!* *J.P.* 957, 1294 *Morris!* Brandon Hill, 700 ft., *Thompson!* Ramble and Belvedere, Hanover, 500 ft., *Fawcett!* Golden Valley, St. Thomas, 600 ft.; Newmarket, 1150 ft.; *Harris!* *Fl. Jam.* 5455, 8100, 8361, 9954, 10,077; *Hansen*; near *Moneague*, *Britton*, 2635!—Cuba, Hispaniola, Porto Rico, St. Vincent, Grenada, Trinidad, Nicaragua, Colombia, Guiana, Brazil, Peru.

*Stem* climbing or creeping indefinitely and rooting, puberulous. *Leaves* 9-17 mm. l., 9-20 mm. br.; stalk 5-2 cm. l. *Spikes* terminal or at tips of very short branches opposite leaves or sometimes axillary; rhachis 8-15 cm. l., 1-1.5 mm. br.; bracts 2-3 about same level on one side, 3-4 mm. br.; peduncle with one scale at base, 5-10 mm. l., puberulous. *Berries* cylindrical-oblong, minutely punctulate, attached horizontally, very shortly stalked, 7-8 mm. l.; beak awl-shaped,  $\frac{1}{2}$  to  $\frac{3}{4}$  length of berry.

§ 6. Berries verruculose, subglobose, apical appendage consisting of an oblique "shield" very shortly produced, with the stigma subcentral.

A. Leaves alternate.

17. *P. rotundifolia* *Kunth* *tom. cit.* 65 (1816); leaves round or oval-roundish, rarely obovate, hispid on both sides, occasionally opposite; spikes fleshy, bracts  $5\text{--}6$  mm. l.; *Griseb. op. cit.* 164; *Hensch. op. cit.* 46, t. *VII*. 2; *Dahlst. op. cit.* 99, t. *XI*. 9; *C. DC. in Urb. Symb. Ant.* *iii.* 228 & *iv.* 188. *P. nummularifolia* *Kunth* *tom. cit.* 66 (1816); *Griseb. op. cit.* 164. *Saururus repens* *folio &c. Plum. Descr. Pl. Amer.* 52, t. 69. *Piper rotundifolium* *L. Sp. Pl.* 30 (1753). *P. nummularifolium* *Sw. Prodr.* 16 (1788) & *Fl. Ind. Occ.* 72. Type in Herb. Stockholm.

*Browne* in *Herb. Linn.!* *Broughton!* *Swartz!* *Bancroft!* *Claverty* *Cottage, J.P.* 972, *Morris!* *Castleton, Harris!* *Fl. Jam.* 8363.—Cuba, Hispaniola, Porto Rico, Guadeloupe, Dominica, Martinique, Antigua, St. Vincent, Grenada, Tobago, Trinidad, Mexico, Central America, Colombia, Venezuela, Guiana, Brazil, Ecuador.

*Stem* creeping indefinitely amongst mosses on trees, and rooting at the nodes, puberulous. *Leaves*  $5\text{--}1$  cm. l.; stalks  $2\text{--}5$  mm. l. *Spikes* terminal, dense-flowered, later somewhat lax,  $1\cdot5\text{--}2$  cm. l.,  $6\text{--}8$  mm. br.; bracts 2-3 about same level all round,  $5\text{--}6$  mm. br.; peduncles  $2\text{--}5$  mm. l. *Berries*  $6\text{--}7$  mm. l.,  $5\text{--}6$  mm. br.; globose-ellipsoidal, apical appendage elliptical-deltoid projecting upwards, about  $\frac{1}{3}$  length of berry with stigma basal.

18. *P. cordifolia* *A. Dietr.* *tom. cit.* 154 (1831); leaves obovate, obcordate, rarely elliptical-roundish, more or less puberulous on upper surface; spikes not fleshy.—*Griseb. op. cit.* 164; *Dahlst. op. cit.* 103; *C. DC. in Urb. Symb. Ant.* *iii.* 228. *Piper cordifolium* *Sw. Prodr.* 16 (1788), *Fl. Ind. Occ.* 71 & *Ic. ined.* t. 30. *P. obcordatum* *Stokes Bot. Comm.* 176 (1830). *Acrocarpidium cordifolium* *Miq. op. cit.* 56 (1843). Type in Herb. Stockholm.

In moist woods amongst moss on trees and rocks; *Broughton!* *Swartz!* *Bertero*; *Macfadyen!* *Purdie* (a form with leaves not obcordate)! *Wilson!* *March*; *Fairfield, Wullschlaegel*; *Moneague, Lady Blake!* near *Mabess River*, 4000 ft.; *Holly Mount, Mt. Diabolo*, 3000 ft.; *Harris!* *Fl. Jam.* 8340, 9011; *Mabess River*, 2500 ft., *G. Nichols!*—*St. Thomas, Dominica.*

*Stem* creeping indefinitely and rooting, puberulous when young. *Leaves*  $1\text{--}2$  cm. l.,  $7\text{--}16$  mm. br.; stalk  $2\text{--}10$  mm. l. *Spikes* terminal on stem or branches, somewhat lax-flowered,  $1\text{--}2$  cm. l.,  $6\text{--}8$  mm. br.; bracts  $4$  mm. br., 1-2 about same level on one side; peduncles  $5$  cm. l.

19. *P. Harrisii* *C. DC. tom. cit.* 243 (1902); glabrous; leaves narrowly oblong, tapering to base and apex, acuminate, without black dots; spikes slender, two or three times as long as leaves.

On trees or amongst peaty soil on rocks; *Belvedere, Hanover*, 500 ft.; *Harris!* *Fawcett!* *Morse's Gap*, 5000 ft.; *Harris!* *Fl. Jam.* 7630, 8322, 8481.

*Stem* very long, branching, hanging from trees in lengths of 3 ft. and more with internodes 4 or 5 cm. l., or growing in peat and rooting along the main stem with erect branches with internodes 1 or 2 cm. l. *Leaves* thin-membranous (when dry), 5-plinerved, 3–6 cm. l., 1·5 cm. br.; stalk 1–3 mm. l. *Spikes* solitary, terminal and axillary; rhachis somewhat lax-flowered, 11–12 cm. l.; bracts ·5 mm. br., 2–4 about the same level on one side; peduncles 4–6 mm. l. *Berries* ·8 mm. l., apical appendage round and wing-like, nearly as broad as berry.

20. *P. alata* Ruiz & Pav. *tom. cit.* 31, *t. 48, fig. b.* (1798); plant glabrous, without black dots; stem with three narrow glabrous wings, of which two are decurrent from the petioles; leaves elliptical-lanceolate, acuminate; petiole glabrous.—*Miq. op. cit.* 87; *Hensch. op. cit.* 40, *t. IV. f. 5*; *Dahlst. op. cit.* 109; *C. DC. tom. cit.* 241 & *iv.* 189. *P. pterocaulis* *Miq. op. cit.* 86 (1843). *P. dendrophila* *Griseb. op. cit.* 165 (1859) (in part). Type in *Herb. Mus. Brit.*

On rocks in woodland; *Purdie!* *Wilson!* *Wullschlaegel!* Kentucky Hill, Bluefields, 2000–2500 ft.; *Harris!* *Fl. Jam.* 10,203.—Cuba, Hispaniola, Porto Rico, St. Cruz, Grenada, Venezuela, Colombia, Ecuador, Brazil, Peru.

*Plant* erect, 15–30 cm. high. *Leaves* 3-nerved with two accessory nerves; blade 4·5–7 cm. l., 2–2·5 cm. br.; petioles ·5 cm. l. *Spikes* 1–2 terminal, solitary axillary; rhachis slightly fleshy, dense-flowered, 6–14 cm. l., to 1·5 mm. br.; bracts ·5 mm. br., 3 on about same level on one side; peduncles 3–6 mm. l. *Berries* bent upwards so as to appear to be attached laterally, ·5–·6 mm. l.; apical appendage projecting slightly above berry.

21. *P. dendrophila* Schlechtend. in *Linnæa v. 74* (1830); plant glabrous without black dots; stem with two inconspicuous ribs decurrent from the petioles; leaves broadly elliptical; petioles glabrous.—*Griseb. op. cit.* 165 (in part). (Fig. 1, G.)

On trees; *Wilson!* *J.P. 1265, Hart!* *Latimer, Cinchona*, 5000 ft.; *Harris!* *Fl. Jam.* 8330.—Porto Rico, Mexico.

*Stem* erect or decumbent, rooting at the nodes, branching. *Leaves* triplinerved with two accessory nerves, 3–7 cm. l., 1·5–3·5 cm. br.; petioles 5–8 mm. l. *Spikes* 1–3 terminal, solitary axillary; rhachis fleshy, dense-flowered, 5–11 cm. l., to 2 mm. br.; bracts ·4–·5 mm. br., 3–4 about same level on one side; peduncles 1–2·5 cm. l. *Berries* ·6–·8 mm. l., bent so as to appear to be attached laterally.

22. *P. Hamiltoniana* *Miq. in Hook. Lond. Journ. Bot. ir. 417* (1845); glabrous, without black dots; leaves elliptical, very shortly stalked, 2–3·5 cm. l.—*C. DC. in Urb. Symb. Ant.* 237. Type in *Herb. Kew.*

*Macfadyen!* (Miquel quotes *Purdie* in error).—St. Cruz, Colombia.

About a foot high, erect, dichotomously branching. *Leaves* crowded at apex of branches, cuneate at base, decurrent into the petiole and stem, somewhat attenuated at the apex and rather obtuse, 3-nerved with two accessory nerves, lower leaves rhomboid-elliptical or subovate-rhomboid, with numerous pellucid dots, 13–16 mm. br.; stalks 3 mm. *Spikes* terminal, solitary, dense-flowered; rhachis slightly fleshy, 4–7 cm. l.; bracts

elliptical and roundish, 2-3 about same level on one side, 6 mm. br.; ovaries obtuse with stigma below the apex; peduncles 2-5 mm. l.

23. *P. glabella* A. Dietr. *tom. cit.* 156 (1831); plant covered with black dots; stem with two inconspicuous ribs decurrent from the petioles and sometimes ciliate; apex of leaves and petioles sometimes ciliate.—*Miq. Syst. Pip.* 97; *Griseb. op. cit.* 165; *Dahlst. op. cit.* 121; *C. DC. tom. cit.* 235 & *iv.* 188. *Piper glabellum* Sw. *Prodr.* 16 (1788) & *Fl. Ind. Occ.* 68. *P. scandens* Sw. *Prodr.* 16 (1788).

In stony places and on walls; *Wright!* *Swartz!* Moneague, *Prior*; *March!* Mount Dakin; near Browns Town, 1200 ft.; *Harris!* Fl. Jam. 5685, 7173.—Cuba, Porto Rico, St. Thomas, Antigua, Martinique, Dominica, Grenada, Trinidad.

Stem creeping and rooting, slender, terete, flowering branches ascending. Leaves ovate to ovate-lanceolate, acute to acuminate, indistinctly triplinerved, sometimes with two accessory nerves, blade generally 2.5-4 cm. l., 1.3-1.8 cm. br.; petiole 5-1 cm. l. Spikes filiform, somewhat dense-flowered, 1-3 together terminal, and solitary axillary, slightly fleshy with shallow elliptical depressions, 5-7 cm. l.; bracts 4-7 mm. br. Berries 5-7 mm. l., slightly curved upwards and attached somewhat laterally at the base; apical appendage projecting above berry about 2 mm.

Var. *caulibarbis* var. *nov.*; leaves broader than in the species and often broadly ovate to ovate-elliptical, apex blunt to acute, 7-nerved, the upper nerves starting from above the base, blade generally 3-5 cm. l., 1.5-2.5 cm. br., petiole relatively shorter than in the species; stem stouter, spike a little thicker than in the species.—*P. caulibarbis* *Miq. Syst.* 98 (1843); *C. DC. in DC. Prodr. xvi. pt. 1.* 409; *Dahlst. Stud.* 117.

On walls and trees; near Mabess River, 4000 ft.; road, Black River to Newmarket, 150 ft.; edge of Great Morass, Negril; *Harris!* Fl. Jam. 8336, 9940, 10,246.—Cuba, Hispaniola, Porto Rico, St. Vincent, Brazil.

Var. *jimenesana* *C. DC. in Urb. Symb. Ant.* *iii.* 236; leaves lanceolate, acuminate, 5-plinerved, 3-5 cm. l., 1-1.7 cm. br.; petiole 4-8 cm. l.

Bog Walk, *Fawcett!* Fl. Jam. 8133.—Hispaniola, Trinidad, Costa Rica (fide *C. DC.*).

24. *P. guadaloupensis* *C. DC. in Seem. Journ. Bot.* *iv.* 139 (1866); glabrous; leaves elliptical-lanceolate to obovate-elliptical, at base cuneate, apex obtuse, with black dots especially underneath; spikes slender, two or three times as long as leaves.—*C. DC. in Urb. Symb. Ant.* *iii.* 239 & *DC. Prodr. xvi. pt. 1.* 416. *P. acuminata* *Griseb. op. cit.* 165 (in part). *P. myrtifolia* *Dahlst. Stud.* 124 (in part). *Piper tenuiflorum* *Vahl in West Bidr. Ste. Croix*, 286 (1793) (specimen in Herb. Banks).

*Wilson.*—Cuba, St. Cruz, Guadeloupe, Guatemala.

Leaves 3-plinerved with an indistinct accessory nerve on each side, 3.5-5 cm. l., 1.8-2.3 cm. br.; stalks 2-5 mm. l. Spikes 2-3 terminal,

solitary axillary, rhachis somewhat lax-flowered, 6–11 cm. l.; bracts ·5–·6 mm. br., round or elliptical, 1–3 about same level on one side; peduncles ·5–1 cm. l. Berries ·7–·8 mm. l., apical appendage somewhat acute.

B. Leaves opposite or whorled.

25. *P. filiformis* A. Dietr. *Sp. Pl.* 177 (1831) (non Ruiz & Pav.); leaves opposite, 3–4 in a whorl at apex of branches, small, linear or obovate-oblong; spikes fleshy.—*Dahlst. Stud.* 125 (excl. syn. *P. linearis* C. DC.); *C. DC. in Urb. Symb. Ant.* iii. 261. *P. Swartziana* Miq. *Syst. Pip.* 155 (1843); *Griseb. op. cit.* 167 (excl. habitat Porto Rico). *Piper filiforme* Sw. *Prodr.* 16 (1788); *Icon. t. 5 & Fl. Ind. Oce.* 73. Type in Herb. Stockholm.

Amongst mosses on decaying logs; *Broughton*! Catherine Peak, *Swartz*! *Purdie*; Green Hill Wood; Morse's Gap, 4900–5000 ft.; near Vinegar Hill, 4200 ft.; Hardware Gap; *Harris*! Fl. Jam. 7781, 7969, 8319, 8333, 10,126; Hardware Gap, 4000 ft.; *G. Nichols*!

Stem filiform, creeping, glabrous. Leaves 5–12 mm. l., 1·5–3 mm. br., pellucid (when dry), apex obtuse, base acute, apex with a few scattered hairs on the upper surface; stalk 2–3 mm. l. Spikes terminal, rhachis with shallow depressions, dense-flowered, 1–1·5 cm. l.; bracts 5–6 mm. br., 1–2 visible about same level; peduncles glabrous, 4–5 mm. l. Berries ·6 mm. l., bent upwards so as to appear to be attached laterally; apical appendage small, ovate-roundish.

26. *P. galiooides* Kunth in *H. B. & K. Nov. Gen. & Sp. i.* 71 (1816); stem erect, puberulous on younger branches; leaves 6–4 in a whorl, subsessile, obovate-oblong or oblong, at length glabrous, with brownish pellucid dots underneath; spikes thin.—*Miq. Illustr.* 22, t. 20; *Griseb. op. cit.* 167; *Hensch. Étud.* 36, t. 4, f. 3; *Dahlst. Stud.* 126, t. XI. 7; *C. DC. loc. cit.* *Piper galiooides* Roem. & Schult. *Syst. i.* 335 (1817).

Near Portland Gap, *McNab*! *Wilson*! *March*; Portland Gap, 5400 ft.; *Harris*! Fl. Jam. 5498.—Hispaniola, Mexico, Costa Rica, Colombia, Venezuela, Ecuador, Bolivia.

Stem erect, branched. Leaves 5–8 mm. l., 2–4 mm. br. (much longer in continental specimens), apex obtuse and minutely puberulous. Spikes 1–3 terminal, solitary axillary; rhachis somewhat lax-flowered (very long in continental specimens), shortly stalked; bracts ·5 mm. br., 1–2 visible about same level. Berries ·7–·8 mm. l., globose-ellipsoidal; apical appendage with a short point.

27. *P. verticillata* A. Dietr. *Sp. Pl. i.* 179 (1831); leaves 3–5 in a whorl, very variable, obovate, obovate-oval, oblong-obovate or roundish, apex rounded or obtuse; indumentum of stem and leaves very variable even on the same plant, pilose densely or sparingly; spikes thin.—*Griseb. op. cit.* 167; *Dahlst. Stud.* 128; *C. DC. in Urb. Symb. Ant.* iii. 262. *P. rubella* Hook. *Exot. Fl. t. 58* (1823). *P. pulchella* A. Dietr. *tom. cit.* 177; *Griseb. loc. cit.* *Saururus erectus minor* foliis &c. *Browne Hist. Jam.* 204. *Piper verticillata* L. *Syst. ed.* 10, 856 (1759),

*Amœn.* v. 391 & *Sp. Pl.* ed. 2, 43. *P. pulchellum* *Haw.* *Succ.* 8 (1812). *P. rubellum* *Haw.* *Succ. Rev.* 3 (1821). (Pl. 1.) Type in Herb. Linn.

On rocky banks amongst shrubs, and on dead trees; *Browne* in Herb. Linn.! *Broughton*! *Swartz*! Hope River, 1300 ft.; *Bellevue*, 4500 ft.;  *Eggers*! St. Helen's Gap, 4800 ft.; near *Latimer*, *Cinchona*, 4800 ft.; *Tweedside*; *Harris*! J.P. 703, Fl. Jam. 8325, 8331.—Cuba, Mexico.

Plant 1-3 dm. high. Leaves 8-2 cm. l., 4-8 mm. br. (in Jamaican specimens); stalk 1-3 mm. l. Spikes terminal and axillary, rhachis somewhat lax-flowered, 2-7 cm. l.; bracts 2 about the same level, 5 mm. br.

*P. rubella* is a form remarkable for the crimson colour of the stem and under surface of leaf, but we cannot find any other distinguishing feature. In Pl. 1, A, we have figured shoots of cultivated specimens from the Cambridge Botanic Garden and Kew Gardens, which illustrate the extreme variability of this species.

28. *P. stellata* *A. Dietr.* *Sp. Pl.* i. 175 (1831); leaves opposite or 3-5 in a whorl, lanceolate, oblong-lanceolate or oblong, sub-acuminate to obtuse, 3-nerved, margin revolute (in drying), glabrous on upper surface, puberulous on the nerves underneath; spikes thin.—*Griseb.* *op. cit.* 167; *C. DC.* *tom. cit.* 270 (excl. syn. *P. rhomboides* *Dahlst.*). *P. turfosa* *C. DC.* *op. cit. v.* 297 (1907). *Piper stellatum* *Sw.* *Prodr.* 16 (1788) & *Fl. Ind. Occ.* 74; *Jacq. Collect. iii.* 212 & *Icon. Rar. ii.* t. 217.

Amongst mosses and peat on rocky banks; *Broughton*! *Wilson*; J.P. 660, *Morris*! *Morse's Gap*, 4900 ft., *Fawcett*! near *Mabess River*, 4000 ft.; near *Cinchona*; *Morse's Gap*; *Harris*! Fl. Jam. 8164, 8317, 8341. “*America meridionalis*” (probably *Jamaica*), *Shakespear*! “*Insulæ Caribææ*” (probably *Jamaica*) *Masson*!

Stem puberulous, erect, branching, 3-5 dm. high. Leaves becoming elliptical below, 2-5 cm. l., generally 5-1.5 cm. br.; stalks 2-5 mm. l. Spikes 1-3 terminal, solitary axillary, lax-flowered; rhachis 3-7 cm. l.; bracts 4-6 mm. br.; peduncles 7-15 mm. l. Berries ellipsoidal-globose, 6-7 mm. l., apical appendage small, round.

29. *P. blanda* *Kunth in H. B. & K. Nov. Gen. & Sp. i.* 67 (1816); leaves opposite, sometimes 3 or 4 in a whorl, sometimes solitary, elliptical, obtuse, or shortly acuminate, 3-nerved, sparingly puberulous on nerves of upper surface, pubescent beneath, margin ciliate, covered with minute black dots beneath, sparingly dotted on upper surface, stalks pubescent; spikes much longer than leaf, lax-flowered, slender, peduncles puberulous.—*Hook. Exot. Fl. t. 21*; *C. DC. in DC. Prodr. xvi. pt. 1*, 458; *Dahlst. Stud.* 131, *t. xi. f. 3*. *Piper blandum* *Jacq. Ic. Rar. ii. C.* 218.

Without locality, *Broughton*!—Tropical continental America to Mexico.

Stem erect, terete, pubescent, 2.5 dm. high. Leaves blade 2-3(-5) cm. l.; 1-1.5 cm. br.; stalks 4-5 mm. l. Spikes geminate, terminal and axillary, rhachis 3-8 cm. l., 1 mm. br.; bracts 6-7 mm. br.

30. *P. barbata* *C. DC. in Urb. Symb. Ant.* v. 297 (1907); leaves small, opposite or in whorls of 3 or 4, round or roundish-elliptical, villose on both sides.

On rocks; near Troy, 2000 ft.; *Harris!* Fl. Jam. 8531.

*Stems* branching from the base, villose, 10–13 cm. high. *Leaves* 10–17 mm. l., 8–13 mm. br.; stalk 2–10 mm. l. *Spikes* 2 or 1 terminal, solitary axillary; rhachis 4–7 cm. l.; bracts 1–2 visible on same level, .5 mm. br.; peduncle hirsute, 5–8 mm. l. *Berries* .75 mm. l., black (when dry).

31. *P. Myrtillus* *Miq. Syst. Pip.* 154 (1843); leaves 4–2 in a whorl, lanceolate or elliptical-lanceolate, more or less acuminate, glabrous, indistinctly 3–5-nerved; spikes thick, fleshy.—*Griseb. op. cit.* 168. *P. rhombea* *C. DC. op. cit. iii.* 269 (1902) & *iv.* 192 (in part) (non *Ruiz & Pav.*); *Dahlst. Stud.* 188 (in part).

On trees; *Wiles*; *Macfadyen!* Morse's Gap, 4900 ft.; Latimer, near Cinchona, 5000 ft.; *Harris!* Fl. Jam. 7968, 8326.—Cuba, Hispaniola, Porto Rico.

*Plant* 2–3 dm. high, branching from base, with 3–6 branches, younger puberulous. *Leaves* 1.5–3 cm. l., 7–10 mm. br.; stalk 2–6 mm. l. *Spikes* terminal and axillary; rhachis 2–6 cm. l., dense-flowered; bracts .5 mm. br., elliptical, 2–3 visible on same level; peduncles 1–4 cm. l. *Berries* .75 mm. l., mucronate with apical appendage; mucro 2 mm. l.

*C. de Candolle* and *Dahlstedt* include this species under *P. rhombea* *Ruiz & Pav.*, but the berries are quite distinct, those of *P. rhombea* having a pseudocupule, as shown by the type in *Herb. Mus. Brit.*

32. *P. polystachya* *Hook. Exot. Fl. t. 23* (1823); leaves 3 in a whorl (sometimes 2 or 4), obovate-subrhomboïd, apex obtuse, pubescent; spikes somewhat fleshy.—*Dahlst. Stud.* 133; *C. DC. in Urb. Symb. Ant. iii.* 271. *Piper obtusifolium* *Jacq. Ic. Pl. Rar. i. t. 9* (1781–1786), non *L.* *P. polystachyon* *Ait. Hort. Kew. 49* (1789); *Haw. Succ. 7.*

Jamaica (*fide* Hooker, loc. cit.).—St. Cruz (*fide* Hooker, loc. cit.), Brazil, Argentina.

*Stem* pubescent. *Leaves* 3–4 cm. l. to 2 cm. br.; 3-nerved; stalk to 5 cm. l. *Spikes* terminal and axillary, somewhat dense-flowered, about double as long as leaves; peduncles shorter than the spikes. *Berries* ovate, mucronate.

§ 7. Berry smooth in the upper part, surrounded at the base, sometimes as high as the middle, with a viscid pseudocupule. Leaves whorled or opposite.

33. *P. reflexa* *A. Dietr. Sp. Pl. i.* 180 (1831); leaves 3–4 in a whorl, small, roundish- or rhombeo-elliptical or elliptical, glabrous on upper surface, sometimes puberulous underneath, especially near the apex; stalk hirtellous; spikes fleshy, densely hirtellous.—*Wight Ic. t. 1923, f. 1*; *Griseb. op. cit.* 168; *Hensch. Étud. 26, t. II. f. 2*; *Dahlst. Stud.* 174, *t. III. f. 24*, *t. VIII. f. 5*; *C. DC. tom. cit.* 263. *Piper reflexum* *L. fil. Suppl.* 91 (1781); *Sw. Obs. Bot.* 23.

On trees and rocks; *Broughton!* *Bancroft!* *Macfadyen!* *Distin!* *March*; *J.P. 1367, Morris!* *Abbey Green*, 3800 ft.; near *Mabess River*, 4500 ft.;

*Harris!* Fl. Jam, 6515, 8337; Newhaven Gap, 5500 ft., *G. Nichols!*—Tropics throughout the world.

Leaves 8-13 mm. l., 6-8 mm. br. Spikes terminal, dense-flowered; rhachis 1-2 cm. l., 2-2.5 mm. br.; bracts, 3 visible about the same level; peduncles puberulous, as long as, or longer than, spikes. Berries ovate-ellipsoidal, 1 mm. l., .5 mm. br., with a pseudocupule reaching to middle; style subconical, .2 mm. l., with stigma at tip.

34. *P. quadrifolia* Kunth in *H. B. & K. Nov. Gen. & Sp. i.* 69 (1816); glabrous; leaves obovate, emarginate, 4 in a whorl; spikes fleshy, dense-flowered.—*Griseb. op. cit.* 168; *Hensch Étud.* 33, t. 4, f. 6; *Dahlst. Stud.* 185, t. III. 17-19; *C. DC. in Urb. Symb. Ant.* iii. 260 & iv. 192. *Piper foliis quaternis &c. Plum. Pl. Amer.* (*Burm.*) 238, t. 242, f. 3. *Piper quadrifolium* L. *Sp. Pl. ed.* 2. 43 (1762).

On trees and rocky banks, amongst mosses; *Broughton!* *Macfadyen!* *McNab!* *Portland!* *Purdie!* *Metcalfe!* *Morris!* *Cinchona*, 5000 ft., *Fawcett!* *Clute!* *Clydesdale*, 4000 ft.; *Cinchona*; *Harris!* Fl. Jam. 7097, 8162, 8314, 8328.—*Hispaniola*, *Porto Rico*, *Mexico*, *Guatemala*, *Venezuela*, *Ecuador*, *Peru*.

Stem rooting below at the nodes, branches diffuse, 10-15 cm. l. Leaves cuneate at base, 9-14 mm. l., 6-9 mm. br.; stalks 2 mm. l. Spikes solitary, terminal; rhachis 3-3.5 cm. l., 1.5-2 mm. br.; bracts .5 mm. br., 2-3 about the same level on one side; peduncles 1.5-2 cm. l. Berries .6-.8 mm. l., inclined upwards, ovate, minutely pitted, pseudocupule  $\frac{1}{3}$  length of berry; mucronate with style, mucro  $\frac{1}{4}$  length of berry.

35. *P. septemnervis* Ruiz & Pav. *Fl. Per.* i. 31, t. 47. c. (1798); glabrous; leaves opposite or 3 in a whorl, lanceolate, acuminate, 7-5-nerved; spikes thick, fleshy.—*Griseb. op. cit.* 168; *Dahlst. Stud.* 191, t. III. 36; *C. DC. in Urb. Symb. Ant.* iii. 271. *P. penicillata* *C. DC. op. cit.* v. 297 (1907), & var. *magnifolia* *C. DC. op. cit.* vii. 190.

On trees and in peat on rocky banks; “*America meridionalis*” (probably *Jamaica*) *Shakespear!* *Macfadyen!* *McNab!* *Purdie!* *March!* *John Crow Peak*, 6000 ft.; near *Morse’s Gap*, 4900 ft.; *Latimer*, near *Cinchona*, 5000 ft.; *Harris!* Fl. Jam. 7966, 8315, 8327.—*Hispaniola*, *Peru*.

Plant 2 to over 3 dm. high. Leaves 3-8 cm. l., 1-2 cm. br. (rarely broader); stalks 4-8 mm. l. Spikes 1-3 terminal and solitary axillary, dense-flowered; rhachis 8-14 cm. l., about 2 mm. br.; bracts .5-.6 mm. br., elliptical or roundish, 2-4 visible about same level; peduncles 2-4.5 cm. l. Berries .75 mm. l., ovate-ellipsoidal, shortly stalked, pseudocupule about middle, mucronate with style; mucro broad, blunt, .25 mm. l.

36. *P. rhomboides* *Dahlst. Stud.* 190 t. iii. f. 32 (1900); stem glabrous but above slightly puberulous; leaves 4 in a whorl, ovate-lanceolate, rhomboid, acuminate, glabrous but more or less ciliate at apex, obsoletely 3-nerved, dotted on both sides; spike very long, terminal, solitary, somewhat thick, dense flowered.

Without locality, *March*.

Stem creeping and rooting, apex and branches erect, angular (when dry). Leaves smaller than those of *P. septemnervis*. Petioles minutely papilloso-puberulous. Spike about 5 times longer than the leaf. Peduncle minutely and sparsely papillose, one-third to one-fourth length of leaf.

*Bracts* oval, 25-3 mm. l. *Berries* subglobose, with stigma at oblique conical apex, 8-1 mm. l.

Description is taken from Dahlstedt, as we have not seen a specimen.

*Berries not seen.*

37. *P. discolor* C. DC. in DC. *Prodri. xvi. pt. 1*, 463 (1869); leaves 3 in a whorl, small, elliptical, subacute at base and apex; stem slender, hispidulous; spike filiform, thin. — C. DC. in Urb. *Symb. Ant. iii.* 261. *P. Myrtillus* forma *Miq.* in Hook. *Lond. Journ. Bot. iv.* 425 (1845). Type in Herb. Kew.

Without locality, Macfadyen!

*Stem* 5-7 cm. high. *Leaves* glabrous on upper surface, minutely velvety-puberulous underneath on the nerves, 15-18 mm. l., 6-8 mm. br.; petioles hispidulous, to 4 mm. l. *Spike* somewhat lax-flowered, 3 cm. l.; peduncle 4 mm. l.

38. *P. Fawcettii* C. DC. *op. cit. v.* 295 (1907); leaves elliptical, sometimes obovate-roundish, puberulous on both sides; spikes fleshy; bracts 4 mm. l.

On trees; Portland Gap, 5550 ft.; Fawcett! Fl. Jam. 8362.

*Stem* creeping, with erect filiform branches, 3-5 cm. l., puberulous when young. *Leaves* 5-1 cm. l., 3-7 mm. br.; stalks 1-2 mm. l. *Spikes* terminal, solitary, before flowering about 1 cm. l.; bracts about 2 on same level on one side; peduncles 3 mm. l.

**2. PIPER L.**

Shrubs or rarely trees; branches usually jointed at the nodes. Leaves alternate, entire (3-fid in *P. Amalago* v. *variifolia*), base often unequal-sided, sometimes with pellucid dots. Flowers

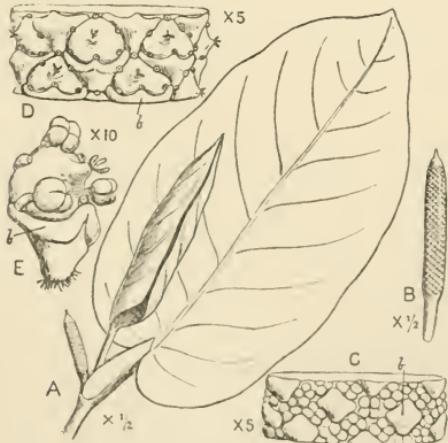


Fig. 2.—*Piper dilatatum*  
L. C. Rich.

- A, Leaves and young spike.
- B, Spike.
- C, Portion of young spike.
- D, Portion of older spike after fall of anthers.
- E, Flower; b, Bract.

sessile. Spikes opposite the leaves or umbellate on an axillary peduncle. Bracts cucullate or peltate. Stamens 2-6. Ovary sessile, obtuse; stigmas generally 3 or 4. Berries small, ellipsoidal, sometimes 3-4-angled, smooth.

## Pepper Elder, Joint Wood.

Species, more than 700, widely distributed through the warmer regions of the globe, wanting in Europe and temperate N. America, most numerous in tropical America.

## I. Spikes opposite the leaves.

1. Leaves palmatinerved. Berries somewhat distant from each other.
  - a. Leaves with all nerves springing from one point quite at the base of the median nerve, equal-sided at base, or almost equal-sided. Berries blunt.
    - Spikes as long as, or a little longer than, the leaves .....
    - Spikes nearly twice as long as leaves.
      - Leaves lanceolate, acute at base.....
      - Leaves ovate, rounded at base.....
  - b. Leaves with the two upper lateral nerves generally springing from a point above the base, not equal-sided at base.
    - Berries mucronate.....
2. Leaves penninerved. Berries crowded together and more or less angled by pressure.
  - a. Leaves penninerved to apex, very unequal at base; petiole grooved, with a margin or wing to the groove.
    - Leaves puberulous underneath on nerves and veins.....
    - Leaves glabrous on both sides.....
  - b. Leaves penninerved scarcely beyond the lower half; petiole without margins.
    - Leaves at base auriculate on the longer side.....
    - Leaves not auriculate.
      - Leaves at base acute on both sides.....
      - Leaves at base rounded at least on one side.
        - Spikes curved.....
        - Spikes erect.
          - Branches more or less pubescent .....
          - Branches villose .....
          - Branches glabrous.....
- II. Spikes umbellate on the apex of an axillary peduncle.....

§ 1. Spikes opposite the leaves. Leaves palmatinerved (and all the nerves springing from one point quite at the base of the median nerve), equal-sided at base or almost equal-sided. Flowers not in a distinct ring or spiral. Bracts cucullate. Berries more or less distinct from one another, at apex blunt.

1. **P. Amalago** L. *Sp. Pl.* 29 (1753); spikes as long as, or a little longer than, leaves.—*Wright Mem.* 229; *Haw. Succ.* 4;

*C. DC. in Urb. Symb. Ant. iii. 167.* P. medium Jacq. *Collect. i. 141* (1786) & *Ic. Rar. i. 2, t. 8*; *C. DC. tom. cit. 165 & op. cit. iv. 184.* P. Berteroanum *C. DC. in DC. Prodr. xvi. pt. 1, 249* (1869). P. unguiculatum *C. DC. tom. cit. 168* non Ruiz & Pav. P. Richardianum *C. DC. in DC. Prodr. xvi. pt. 1, 249 & in Urb. Symb. Ant. iii. 169.* Piper longum arboreum &c. *Sloane Cat. 44 & Hist. i. 134, t. 87, f. 1.* Piper frutescens diffusum &c. *Browne Hist. Jam. 121*; *Enckea Amalago Griseb. Fl. Br. W. Ind. 169* (1859) (in part). Type in Herb. Mus. Brit.

“Cope’s Plantation” *Sloane Herb. ii. 79, 80!* *Browne in Herb. Linn.!* *Plukkenet in Herb. Sloane xc. 105, ci. 109!* *Wright! Broughton!* mountains, *Swartz! Caley! Bertero; Macfadyen! Distin!* Westmoreland Mts. and near Holland Bay, *Purdie! Wilson; Prior! March; Newcastle, J.P. 1432, 1437, Hart! J.P. 2111, Morris!* Toms River, *Thompson!* Hope Tavern, 600 ft.; *Campbell!* Robertsfield; Yallahs Valley, Blue Mts., 2500 ft.; *Green River, 3500 ft.; Hope Mines, 750 ft.; road to Guava Ridge, 1500 ft.; Stanmore Hill, 2200 ft.; Harrys!* Fl. Jam. 6505, 6590, 8049, 8342, 8353, 8354, 9972; *Millspaugh.*—W. Indies, tropical America to Peru, Paraguay, Argentina.

*Shrub* 6–16 ft., or small tree 20 ft.; branches glabrate or hirtellous. Leaves variable in form and indumentum, ovate-elliptical, elliptical, oblong-ovate or lanceolate, acuminate, rounded or acute at base, glabrous on upper surface, glabrous, or puberulous on nerves underneath, with very numerous pellucid dots, 5–14 cm. l., 2–7 cm. br.; stalks puberulous, hirtellous, or glabrate, 5–1 cm. l. Spikes dense-flowered and shorter than the leaf, afterwards lax and as long or longer than the leaf; peduncle glabrous, puberulous or hirtellous, as long as, or twice as long as the petiole.

De Candolle separates *P. medium* Jacq. from *P. Amalago* L. by the presence of hairs on the branches, leaves, and bracts of the former, but we cannot find that this character is constant. The forms named *P. medium* have generally a broader leaf and are more or less puberulous.

We have also included Jamaican specimens distributed as *P. unguiculatum* Ruiz & Pav. They do not correspond with the specimen from Ruiz & Pavon in *Herb. Mus. Brit.*, in which the berries are fleshy and much crowded.

Var. *variifolia*; leaves unequally 3-lobed, lateral lobes very short, median long linear-acuminate.—*P. panduratum C. DC. in DC. Prodr. xvi. pt. 1, 250* (1869). *P. subpanduriforme C. DC. in Urb. Symb. Ant. iii. 170* (1902). *Enckea Amalago* var. *variifolia* *Griseb. loc. cit.* (1859).

Fairfield, *Wullschlaegel.*

2. *P. Wullschlaegelii C. DC. in DC. Prodr. xvi. pt. 1, 249* (1869); leaves subovate-lanceolate, at base acute; spikes nearly twice as long as the leaf.—*C. DC. in Urb. Symb. Ant. iii. 168.*

St. Thomas-in-East, *Wilson*; between Fairfield and Nazareth, *Wullschlaegel.*

*Shrub.* Branches glabrous. Leaves with minute pellucid dots, apex attenuate-acuminate, glabrous on both sides; limb 6 cm. l., 2 cm. br.; stalk glabrous, 4 mm. l. Peduncle glabrous, a little longer than the leaf-stalk.

3. *P. nigrinodum* C. DC. in *Urb. Symb. Ant.* v. 294 (1907); leaves ovate, at base rounded; spike nearly twice as long as leaf.

Black Jointer.

Near Troy, 1500 ft., Harris! Fl. Jam. 9075.

Shrub 10 ft. high. Branches glabrous, striate, slender, flexuose, jointed, black. Leaves small, apex acuminate, thinly membranous (when dry), with very numerous minute pellucid dots, glabrous on both sides; limb 4·5-7 cm. l., 2·5-4 cm. br.; stalks slender, glabrous, 5-7 mm. l. Spikes somewhat dense (in fr.), about 8 cm. l.; peduncles glabrous, 10-13 mm. l. Berries about 2 mm. l.

§ 2. Spikes opposite the leaves. Leaves palmatinerved (the two upper lateral nerves springing from a point above the base), the sides slightly unequal at the base. Flowers not in a distinct ring or spiral. Bracts subcucullate. Berries more or less distant from one another, at apex mucronate.

4. *P. discolor* Sw. *Prodr.* 15 (1788), *Fl. Ind. Occ.* 52 & *Ic. ined.* t. 55.—*P. Swartzii* C. DC. in *Urb. Symb. Ant.* iii. 202. Type in Herb. Stockholm.

Swartz! *Wilson*; *March*; near Whitfield Hall Works, Blue Mts.; below Vinegar Hill, 3500 ft.; between Askenish and Dolphin Head; Harris! Fl. Jam. 5175, 7447, 8347, 9254.

Shrub 8-10 ft. high. Branches, younger puberulous, afterwards glabrate. Leaves elliptical to broadly elliptical, at base unequal-sided, generally rounded on the longer side and acute on the shorter side, acuminate, on both sides glabrous, membranous, with very numerous pellucid dots, 6-7·5 cm. l., 3-5·75 cm. br., difference between the sides of the limb 2-4 mm.; stalks glabrate, 4-6 mm. l. Spike somewhat shorter than the leaf, becoming somewhat lax in fruit; peduncle glabrate, longer than the leaf-stalk.

§ 3. Spikes opposite the leaves. Leaves pinninerved, the sides not equal at the base. Flowers in distinct spirals or rings. Bracts peltate. Berries crowded together and more or less angled by pressure, at apex blunt.

A. Leaves pinninerved to apex, very unequal at base; petiole grooved, with a margin to the groove.

5. *P. tuberculatum* Jacq. *Collect.* v. 7 (1786-96); leaves puberulous on nerves and veins beneath.—Jacq. *Ic. Rar. ii.* 2, t. 211. *C. DC.* in *Urb. Symb. Ant.* iii. 177.

Bertero; Macfadyen!—Cuba, Porto Rico, Guadeloupe, Tobago, Trinidad, Mexico, Panama, Columbia, Brazil, Venezuela.

Tree about 16 ft. high. Branches younger puberulous or glabrate. Leaves ovate-elliptical or oblong, base rounded on both sides, sometimes subcordate, apex obtuse to subacute, glabrous above, puberulous on nerves and veins below, pinninerved to apex, membranous (when dry), sparingly gland-dotted, 9-14 cm. l., 4-6 cm. br.; difference between the sides of the limb to 15 mm.; stalks puberulous, 7 mm. l. Spike as long as, or longer than, the leaf; peduncle puberulous or glabrate.

6. *P. arboreum Aubl. Pl. Guian. i. 23 (1775)*; leaves glabrous on both sides.—*P. geniculatum C. DC. tom. cit. 178.*

Shrub or tree 6–25 ft. high. Branches glabrous, nodes more or less swollen. Leaves variable—ovate, oblong-ovate, oblong, elliptical or lanceolate, at the base rounded or acute on each side, apex obtuse or acute, and sometimes attenuated or acuminate, glabrous on both sides, with no pellucid dots, or only a few indistinct; stalk glabrous. Spikes obtuse, shorter than the leaves; peduncle glabrous, about equal to the whole petiole.

There appear to be several forms of this species, the chief are:—

Form *geniculata*, leaves large, elliptical or oblong-elliptical, apex obtuse, base rounded or subcordate, somewhat leathery, 15–40 cm. l., 6–14 cm. br.; nodes more or less swollen.—*P. geniculatum Sw. Prodr. 15 (1788)*, *Fl. Ind. Occ. 57 & Ic. ined. t. 51*; *C. DC. in Urb. Symb. Ant. iii. 178.* *P. macrophyllum Sw. Prodr. 15 & Fl. Ind. Occ. 54*; *Haw. Succ. 3.* *P. verrucosum Sw. Prodr. 15 & Fl. Ind. Occ. 56.* *Artanthe xestophylla Miq. Syst. Pip. 491 (1844).* *A. Lessertiana Miq. op. cit. 405.* *A. verrucosa* and *A. macrophylla Griseb. Fl. Br. W. Ind. 171 (1859).* *Piper longum arboreum foliis latissimis Sloane Cat. 45 & Hist. i. 135, t. 88, f. 1.* *Piper frutescens minus &c. Browne Hist. Jam. 122.* Type in Herb. Mus. Brit.

Woods; “Rio Nuovo on north side of island,” *Sloane*, Herb. ii. 84 and *Ic. ined.* St. Mary; St. Elizabeth; *Browne*; *Swartz!* *Wright!* *Macfadyen!* St. Mary, *McNab!* St. Ann and Westmoreland, *Purdie!* *Wilson!* Moneague; Pleasant Valley; *Prior!* near Colthirst River, St. George; between Askenish and Dolphin Head, 1200 ft.; *Tyre*, near Troy, 2000 ft.; *Harris!* *Fl. Jam. 5569, 8734, 9242, 9465.*—Cuba, Trinidad, tropical S. America.

Form *nitida*, leaves lanceolate, oblong or elliptical, apex generally acuminate, at base attenuated or obtuse, papery (when dry), 8–15 cm. l., 3–6 cm. br.—*P. nitidum Sw. Prodr. 15, Fl. Ind. Occ. 58 & Ic. ined. t. 52*; *Haw. Succ. 5.* Type in Herb. Stockholm.

*Wright!* *Swartz!* *Macfadyen!* Guy’s Hill, St. Mary, *Purdie!* J.P. 1122, *Morris!* Newcastle, J.P. 529, 2109, *Hart!* Morse’s Gap, 4900 ft., *Harris!* John Crow (Blake) Mts., 1500 ft.; *Harris* and *Britton!* *Fl. Jam. 8324, 10,774;* near Moneague, *Britton* 2661! Fern Gully, Ocho Rios, *Britton* and *Hollick* 2696!

Form *staminea*, very like form *nitida*, but leaves more leathery (when dry), generally narrower and less acuminate; slender tree, 20–30 feet high.—*Artanthe staminea Miq. in Hook. Lond. Journ. Bot. iv. 461 (1845).* *Piper stamineum C. DC. tom. cit. 176.* *P. olens C. DC. in Urb. Symb. Ant. vii. 182 (1912).*

Manchester Mts., *Purdie!* Woodstock, Westmoreland; lower slopes of Dolphin Head; *Harris!* *Fl. Jam. 9832, 10,295.*—Cuba, Porto Rico.

B. *Leaves pinninerved scarcely beyond the lower half; petiole without margins.*

7. *P. otophyllum C. DC. in Urb. Symb. Ant. iii. 196 (1902);* leaves at the base very unequal-sided, the longer side auriculate and covering the stalk.

Jinty Benña.

Between Cinchona and Morse's Gap, Fawcett! Latimer, near Cinchona, 5000 ft.; Bryan's Hill, 3000 ft.; Dollwood; Harris! Fl. Jam. 5108, 8159, 8197, 8329, 8349.

Shrub 6-8 ft. high. *Branches villose.* *Leaves* elliptical or ovate-elliptical, the shorter side at base rounded or subacute, apex acuminate, villous on both sides, especially on the nerves below, the older leaves bullulate, rough above, pinninerved in lower half, papery (when dry), with numerous pellucid dots, 8-15 cm. l., 4-8 cm. br.; stalk villous, below the limb 1-9 mm. l., between the sides of the limb 2-5 mm. l. *Spike* nearly as long, or as long, as the leaf; peduncle glabrous, generally longer than the leaf-stalk.

Form *troyana* *form. nov.*; leaves above smooth, glabrate, below hirtellous with adpressed hairs especially on the nerves; stalk puberulous; branches at first puberulous, then glabrate or roughish.

Near Troy, 1500 ft., Harris! Fl. Jam. 8545.

8. *P. Ledebourii* var. *jamaicense C. DC. tom. cit. 182 (1902);* leaves at the base slightly unequal-sided, on both sides acute; branches glabrous.

Hills above Kingston, 490 ft., Lehmann.

Shrub 6 ft. high. *Leaves* oblong-elliptical, acuminate, glabrous on upper surface, with a few adpressed hairs on nerves and veins underneath, with a few pellucid dots, to 13 cm. l., 5 cm. br.; stalks glabrous, below the limb 5 mm. l., between the sides of the limb almost 3 mm. l. *Spikes* a little shorter than the leaf; peduncle glabrous, shorter than the whole petiole.

9. *P. aduncum L. Sp. Pl. 29 (1753);* leaves oblong-elliptical to lanceolate, at base rounded or subcordate; spikes more or less curved; branches puberulous or glabrate.—*Wright Mem. 247; Haw. Succ. 3; C. DC. in Urb. Symb. Ant. iii. 184, iv. 185.* *P. longum folio nervoso &c. Sloane Hist. i. 135, t. 87, f. 2.* *P. frutescens diffusum &c. Browne Hist. Jam. 122.* *Artanthe adunca Miq. Comm. Phyt. 49, t. 4, f. 1 (1838); Griseb. op. cit. 171.*

Rio Cobre, Sloane, Herb. ii. 81! Houstoun! Wright; Broughton; Dancer! Shakespear! Swartz! Macfadyen! Murray; Hopewell, St. Mary, McNab! Moneague, Prior! near Port Morant, Hitchcock; J.P. 2105, Morris! Hope, 600 ft., Campbell! Cedar Hurst; Green River, 3500 ft.; road to Guava Ridge, 1800 ft.; Harris! Fl. Jam. 5214A (in part), 6431, 8345, 8355.—Cuba, Isle of Pines, Hispaniola, Porto Rico, St. Vincent, Grenada, Barbados, Tobago, Trinidad, Tropical America.

Shrub 12-20 ft. high. *Leaves*, apex long-acuminate, rough above and hirtellous on nerves, pubescent below, especially on the nerves, papery

(when dry), with pellucid dots, 14–20 cm. l., 4–7 cm. br.; stalk very short, 3–7 mm. l., puberulous. *Spike* shorter than the leaf; peduncle puberulous, 2 or 3 times as long as the petiole.

10. *P. seabrum* Sw. *Fl. Ind. Occ.* 59 (1797) & *Ic. ined.* t. 54; leaves broadly elliptical-ovate, acuminate, rounded or obtuse at the base, rough on both sides, hirtellous above on young leaves, pubescent underneath on nerves and veins; petiole, peduncle and branches hirsute-tomentose.—*C. DC. in Urb. Symb. Ant.* iii. 187 & iv. 185, under *P. hispidum* Sw. *P. hirsutum* var. *jamaicense* *C. DC. in Prodr. xvi. pt. 1*, 276 (1869). *Artanthe scabra* *a Griseb. loc. cit.* Type in Herb. Stockholm.

*Broughton!* *Swartz!* *Port Antonio, Von Rohr!* *Caley!* *Distin!* *Wilson!* *Moneague;* *Pleasant Valley;* *Prior!* *March!* *J.P.* 873, 1045, *Morris!* *Cedar Hurst;* *road to Guava Ridge, 2000 ft.;* *near Troy, 1500 ft.;* *Harris!* *Fl. Jam.* 5214a (in part), 8357, 8544.—*Cuba, Hispaniola, Porto Rico, Guadeloupe, Martinique, St. Vincent, Tobago, Trinidad, tropical America.*

*Shrub.* *Branches* at length glabrate or rough. *Leaves* acuminate, with obscure pellucid dots, 12–20 cm. l., 4–11 cm. br.; stalks short. *Spikes* shorter than leaf, 10–13 cm. l.; peduncle about as long as the whole petiole.

11. *P. hispidum* Sw. *Prodr.* 15 (1788) & *Ic. ined.* t. 53; leaves oblong-elliptical, at base obtuse or subacute on longer side, villous on upper surface and on nerves and veins beneath; petiole, peduncle and branches villous with jointed hairs.—*C. DC. in Urb. Symb. Ant.* iii. 187; *Haw. Succ.* 5. *P. hirsutum* Sw. *Fl. Ind. Occ.* 60 (1797). *P. Harrisii* *C. DC. tom. cit.* 189; var. *macrophyllum* *C. DC. op. cit. vii.* 183. *P. Fadyenii* *C. DC. op. cit. iii.* 191. *Artanthe scabra* *β hirsuta* *Griseb. loc. cit.*

*Swartz!* *Macfadyen!* *McNab!* *Portland Gap, Purdie!* *Morris!* *near Whitfield Hall Works, Blue Mts.;* *Green River, 3500 ft.;* *Harris!* *Fl. Jam.* 5174, 8344; *Clyde River, 4000 ft., G. Nichols!* *Whitfield Hall, Maxon!*—*Cuba.*

*Shrub.* *Branches* at length glabrate. *Leaves* with obscure pellucid dots, 8–13 cm. l., 2·5–6 cm. br.; stalks short. *Spikes* shorter than the leaf; peduncle about as long as the whole petiole.

12. *P. jamaicense* *C. DC. in Urb. Symb. Ant.* iii. 192 (1902); leaves elliptical-oblong or oblong-lanceolate, at the base rounded on the longer side, roundish, obtuse or acute on the shorter, apex acuminate, glabrous or roughish on the upper surface, hirtellous with adpressed hairs on the nerves underneath; petiole hirtellous with adpressed hairs or glabrate; peduncle and branches glabrous, or at first pubescent, at length glabrate.—*P. Murrayanum* *C. DC. in DC. Prodr. xvi. pt. 1*, 280 (1869). *P. guavanum* *C. DC. in Urb. Symb. Ant.* iii. 190. *Artanthe jamaicensis* *Griseb. op. cit.* 170 (1859) (excl. syn.).

*Murray;* *Prior!* *March!* *Guava Ridge, 2000 ft., Eggers;* *Bluefield Mt., Britton and Hollick 2474!* *Castleton Hill, 1000 ft., Thompson!* *Green*

River, 3500 ft.; Bryan's Hill, 3000-3500 ft.; Guava Ridge road, 1500 ft.; *Harris!* Fl. Jam. 8027, 8343, 8349, 8350, 8358; Hardware Gap, 4000 ft., *G. Nichols!*

*Shrub* or small tree 6-12 ft. high. *Leaves* with pellucid dots, 7-13 cm. l., 2-5-5 cm. br.; stalks below the limb 1-5 mm. l., between the sides of the limb 2-5 mm. l. *Spikes* half as long, to as long, as the leaf; peduncle as long as the petiole, or two or three times as long.

Form *microphyllum* *form. nov.*; leaves smaller than in the typical species, ovate-elliptical, rough on upper surface, 5-7 cm. l., 2-3 cm. br.—*P. microphyllum* *C. DC. op. cit.* 190.

Near Whitfield Hall Works, Blue Mts., *Harris!* Fl. Jam. 5172.

13. *P. dilatatum* *L. Cl. Rich. in Act. Soc. Hist. nat. Paris*, 105 (1792); leaves large, elliptical or rhomboid-ovate, at the base unequally cordate, apex acuminate, with sparsely scattered hairs on both sides especially on the nerves; petiole grooved at the base, hirtellous; peduncle puberulous or glabrate, generally shorter than the petiole.—*C. DC. op. cit.* 197.

*Caley!*—Lesser Antilles, continental tropical America.

*Shrub* 8-10 ft. high. *Branches*, when young, puberulous, afterwards glabrate. *Leaves* 14-20 cm. l., 7-11 cm. br., difference between the sides of the limb about 5 mm.; stalk 1-1.5 cm. l. *Spikes* one-fourth to one-half as long as the leaf. *Bract* villous.

§ 4. *Spikes* umbellate on the apex of an axillary peduncle.

Leaves large, cordiform or peltate. Berries crowded together and more or less angled by pressure.

14. *P. umbellatum* *L. Sp. Pl.* 30 (1753); *Haw. Succ.* 3; *C. DC. in Urb. Symb. Ant.* iii. 210 & iv. 187. *P. peltatum* *L. loc. cit.*; *Haw. loc. cit.*; *C. DC. in Urb. Symb. Ant.* iii. 208 & iv. 186. *P. longum* *racemosum* *malvaceum* *Sloane Cat.* 45, *Hist. i.* 136. *Potomorphe umbellata* *Miq. Comm. Phyt.* 36 (1840); *Griseb. op. cit.* 169. *P. peltata* *Miq. op. cit.* 37 (1840); *Griseb. loc. cit.*; *Britton in Torr. Bot. Club Bull.* xxxv. 566.

Colt's-foot.

*Sloane*, Herb. ii., 86\*, 87; viii. 135 (2), and 149 (3)! *Swartz!* *Houstoun!* *Broughton!* *Shakespear!* *Murray!* *Distin!* *McNab!* *St. Mary, Purdie!* *Prior!* *March!* *Resource plantation, Hart!* *Moore Park, Portland, 2000 ft.*; road to Guava Ridge, 2000 ft.; Castleton district, 500 ft.; *Harris!* J.P. 1261, 1264; Fl. Jam. 6631, 8356, 8441, 8442; near Kingston, *Hansen!* Norwich, *Millsbaugh*.—Throughout the West Indies and tropical America.

*Shrub* 2-6 ft. high. *Branches* glabrous in the peltate form, puberulous in the other. *Leaves* with long stalks, large, sometimes peltate, roundish, at base repand-cordate or deeply cordate, at apex acute or attenuate-acute, glabrous on both sides usually in the peltate form, puberulous on the nerves on both sides in the other form, palmatinerved, the central nerve with two pinnate nerves on each side below, with numerous pellucid dots, 1-3 dm. l. and br.; stalk glabrous in the peltate form, puberulous in the other, about 2 dm. l.; common *peduncle* several times shorter than the leaf-stalk, 1-7 cm. l., glabrous in the peltate form, puberulous in the other. *Spikes* 4-10, umbellate.

## FAMILY II. CHLORANTHACEÆ.

Aromatic shrubs or trees. Leaves opposite, serrate, pinniveined, stipules connate into a sheath and enclosing the stem. Inflorescence terminal or axillary. Flowers hermaphrodite or

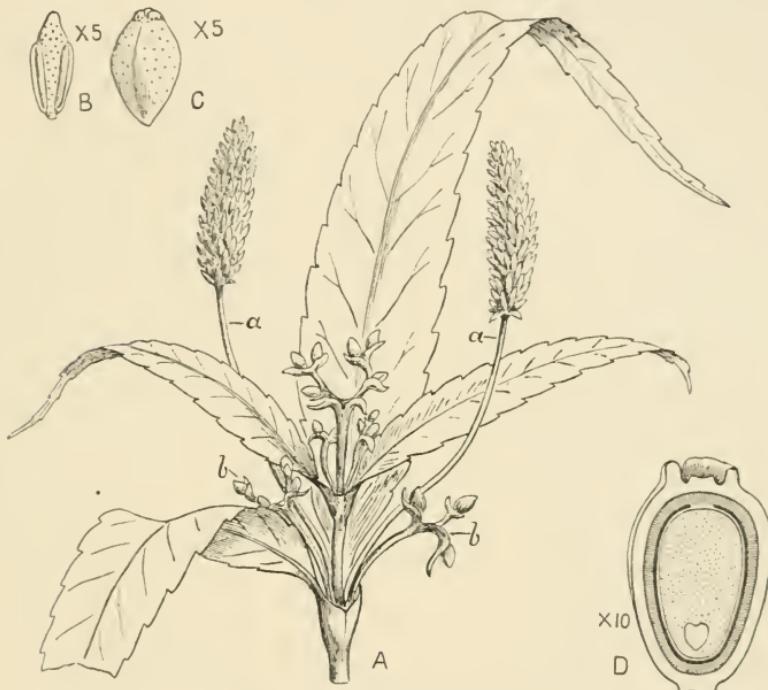


Fig. 3.—*Hedyosmum nutans* Sw.

A, End of shoot with male (*a*) and female (*b*) inflorescences.  
 B, Male flower.  
 C, Female flower.  
 D, Fruit of *H. arboreascens* Sw., cut lengthwise (after Baillon).

unisexual. Male flowers spicate; perianth wanting. Stamens; filaments very short, continuous with the connective; anthers 2-celled. Female flowers paniculate; perianth superior, inconspicuous. Ovary 1-celled; ovule single, orthotropous, pendulous from the apex. Drupe small, ovoid or globose, exocarp succulent. Seed of same shape, pendulous; embryo minute at the base of a copious endosperm.

About 40 species, distributed through tropical America, tropical and east Asia, and the islands of the Pacific to New Zealand.

## HEDYOSMUM Sw.

Branches jointed at the nodes. Flowers unisexual, sometimes dioecious. Male flowers, without bracts. Anther single, oblong; the connective produced beyond the cells; the cells parallel, dehiscing longitudinally. Female flowers paniculate; perianth very short, 3-lobed; style very short. Drupe 3-cornered.

About 21 species, natives of the West Indies and tropical America.

## Headache Bush.

Leaves lanceolate .....	1. <i>H. nutans</i> .
Leaves oblong-elliptical .....	2. <i>H. arborescens</i> .

1. *H. nutans* Sw. *Prodr.* 84 (1788); monoecious; leaves narrowly lanceolate, long-acuminate; anthers with the connective produced beyond the cells nearly as long as the cells; female flowers distant from each other along the branches of a cymose panicle.—*Sw. Fl. Ind. Occ.* 959, t. 18; *Griseb. Fl. Br. W. Ind.* 173; *Solms in DC. Prodr.* xvi. pt. 1, 479; *Engler in Engl. & Prantl Nat. Pfl.* iii. pt. 1, 13, f. 13. (Fig. 3, A-C.)

Flowers throughout the year; *Wright!* *Broughton!* *Shakespear!* *Swartz!* *Macfadyen!* *Morse's Gap, McNab!* Port Royal Mts., *Purdie!* *Wilson!* Blue Mts.; *Moneague; Prior!* Morse's Gap, J.P. 900, *Morris!* *Keith Hall*, 2000 ft., *Thompson!* Kentucky Hill, Bluefields Mt., 2000-2500 ft., *Harris!* *Fl. Jam.* 6467, 7976, 10,204.—Cuba.

Shrub 6-12 ft. high. Leaves 6-12 cm. l., 11-18 mm. br. Male spikes axillary with the female panicles, at first ellipsoidal, 1 cm. l., then cylindrical 2 cm. l.; with long peduncles 3 cm. l. Female flowers, each with an ovate bract. Drupe 2 mm. l.

2. *H. arborescens* Sw. *Prodr.* 84 (1788); dioecious; leaves oblong-elliptical, shortly and abruptly acuminate; anthers, the connective scarcely produced beyond the cells, subpeltate at apex; female flowers in clusters of two or three enclosed by bracts, clusters arranged along a panicle.—*Sw. Fl. Ind. Occ.* 961; *Griseb. loc. cit.*; *Solms tom. cit.* 482; *Baill. Hist.* iii. 478; *Engler tom. cit.* 12, f. 11; *Urb. Symb. Ant.* iv. 192. (Fig. 3, D.)

Flowers Aug.; *Wright!* *Broughton!* *Swartz!* *Macfadyen!* Manchester, *Purdie!* *March!* J.P. 1084, *Morris!* Catherine Peak, 4000 ft., *Eggers!* *Morse's Gap, G. Nichols!*—Cuba, Porto Rico, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Trinidad, Brazil.

Shrub 12-16 ft. high. Leaves 3-12 cm. l., 1.5-4 cm. br. Male spikes ellipsoidal, to 1 cm. l., in clusters along a common peduncle. Drupe 3 mm. l.

## FAMILY III. LACISTEMACEÆ.

Shrubs or small trees. Leaves alternate, distichous, shortly stalked, penniveined, without stipules. Flower-spikes slender, cylindrical, short, sessile, clustered in the axils. Bracts imbricate, small, broad, concave. Bracteoles 2, at the base of the very short pedicel, linear-subulate. Flowers hermaphrodite, solitary under the bracts. Perianth of distinct, unequal segments.

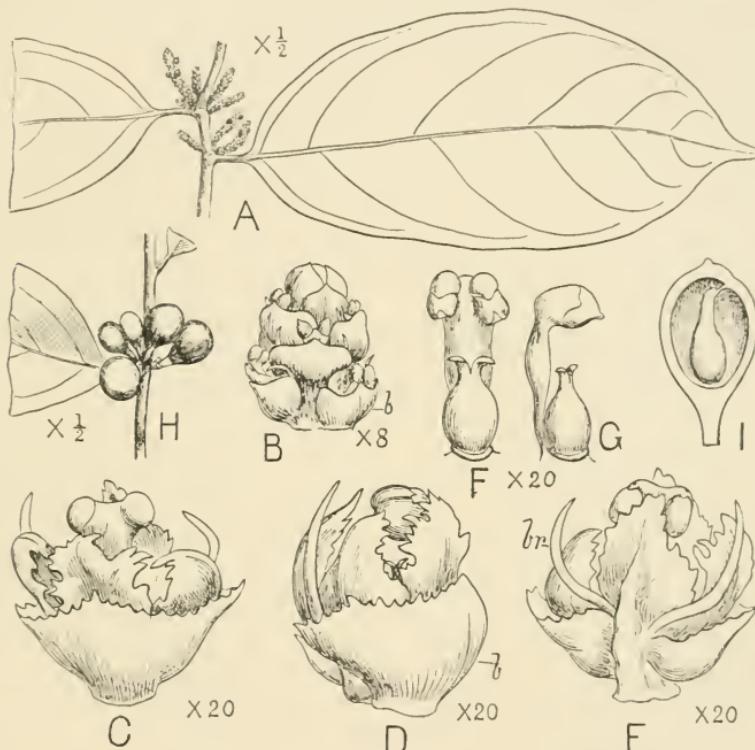


Fig. 4.—*Lacistema aggregatum* comb. nov.

A, Leaves and spikes.

B, Tip of spike.

C, D, E, Front, side and back view of a flower from lower part of spike with *b*, bract and *br*, bracteole.

F, G, Front and side view of anther and pistil.

H, Fruits.

I, Section of fruit with seed.

Disk somewhat fleshy. Stamen 1, on the disk. Anther at the apex of a filament, of two distinct cells on the forked connective, dehiscing longitudinally. Ovary superior in the centre of the disk, with two or three short stigmas, 1-celled, with three parietal placentas. Ovules one or two on each placenta, anatropous, pendulous. Capsule ovoid or subglobose, dehiscing by three valves. Seed solitary, pendulous. Embryo in the centre of, and

a little shorter than, the endosperm, straight; cotyledons foliaceous, about as long as the radicle.

One genus with 17 species, all natives of tropical America, from the West Indies and Mexico to Brazil and Peru.

### LACISTEMA Sw.

*L. aggregatum* comb. nov.—*L. myricoides* Sw. *Prodri.* 12 (1788), *Fl. Ind. Occ.* 1093, t. 21 & *Icon. Pl.* t. 1; *Schnizl. in Fl. Bras.* iv. pt. 1, 282, t. 81, f. 3; *Griseb. Fl. Br. W. Ind.* 25; *A. DC. Prodri.* xvi. pt. 2, 591. *Piper aggregatum* *Berg. in Act. Helv.* vii. 131, t. 10 (1772). *P. fasciculare* *Rudge Pl. Guian.* t. 4 (1805). (Fig. 4.)

*Wright!* *Swartz!* *Purdie!* *Bath, Wilson;* *Moneague, Prior!* *March;* *Dolphin Head;* *near Troy, 2000 ft.;* *Harris!* *John Crow (Blake) Mts., Harris & Britton!* *Fl. Jam.* 10,308, 10,675, 10,740; *Union Hill, near Moneague, Britton & Hollick, 2805!*—Central America and tropical S. America.

Small tree 15–20 ft. high. Leaves elliptical or elliptical-oblong, shortly acuminate, entire, glabrous, 8–11 cm. l., 3–5 cm. br.; stalk 5 cm. l. Spikes greenish-yellow, as many as seven in each axil, generally longer than the petiole. Sepals 4, irregularly ovate, serrulate, the anterior sometimes obovate. Disk ample. Fruit ellipsoidal, 6–8 mm. l.

### [FAMILY SALICACEÆ.]

Trees or shrubs. Leaves alternate, penniveined. Stipules free. Flowers dioecious, in catkins, solitary in axil of each bract. Perianth wanting. Male flowers: stamens 2 to indefinite, on the receptacle. Female flowers: ovary 1-celled, with 2–4 parietal placentas. Ovules ascending, anatropous. Capsule 2–4 valved. Seeds numerous, small, densely hairy. Endosperm wanting. Embryo straight; cotyledons flattish, equal; radicle very short, inferior.

Species about 200, mostly in the north temperate zone; a few tropical.

### SALIX L.

Catkins dense, erect, with sessile flowers. Disk of 1–2 glands. Ovary with 2 placentas. Ovules 4–8 on each placenta. Capsule 2-valved.

Species about 170, with distribution of the Family.

Willow.

*S. chilensis* *Molina Sagg. Stor. Nat. Chil.* 169 (1782).—*S. humboldtiana* *Willd. Sp. Pl.* iv. 657 (1805); *Kunth in H. B. & K. Nov. Gen. & Sp.* ii. 22, tt. 99–100; *Leybold in Fl. Bras.* iv. pt. 1, 227, t. 71; *Griseb. Fl. Br. W. Ind.* 113.

Purdie! Wilson; Troy, 2000 ft., Harris! Fl. Jam. 8748.—Cuba, Porto Rico, Texas, Mexico, S. America to Chile.

Tree to 40 ft. high. Leaves linear, acuminate, serrulate, glabrous, to 13 cm. l., to 8 mm. br.; stipules deciduous. Catkin 5–7 cm. l., terminal on leafy branches, appearing with the leaves; bracts woolly, deciduous. Stamens 4–7. Capsules about 4 mm. l., glabrous, ovate, stalked; stalk much longer than the gland.

Mr. W. Harris states:—"The *Salix* trees at Troy were certainly planted, and I have never seen this species in a wild state. Mr. Muirhead, a very old resident near Troy, told me that a friend of his brought the original cuttings from some part of South America."]

#### FAMILY IV. MYRICACEÆ.

Trees or shrubs, generally aromatic. Leaves alternate, penniveined; stipules wanting. Flowers unisexual, sessile under the scale-like bracts, in short cylindrical spikes. Perianth

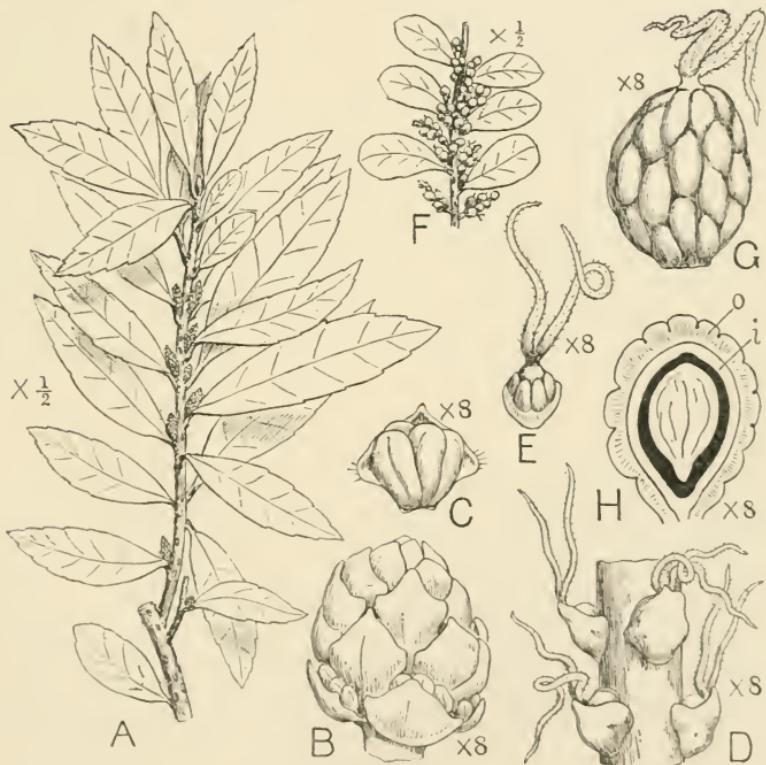


Fig. 5.—*Myrica microcarpa* Benth.

- A, Shoot with male spikes.
- B, Young male spike.
- C, Male flower.
- D, Portion of female spike.
- E, A female flower with bract cut off.

- F, Twig with fruit.
- G, Fruit.
- H, Fruit with seed cut lengthwise; *o*, outer soft layer; *i*, inner hard layer of pericarp.

wanting, but the flowers, especially the female, have 2-4 bracteoles within the bract. Male spikes on branches of the first year's growth. Stamens on a receptacle which is adnate to the base of the bract, with short filaments. Anthers with 2 distinct parallel cells dehiscing longitudinally. Female flowers: ovary 1-celled; style short with 2 filiform branches stigmatic on the inside. Ovule solitary, erect, orthotropous. Drupe small, bearing waxy papillæ. Seed without endosperm. Embryo straight; cotyledons flat; radicle short, superior.

Species 58, widely dispersed in the temperate and warmer regions of the whole globe, except Australia.

### MYRICA L.

This genus is the only one in the Family.

Leaves not pitted on upper surface but with a few superficial yellow glands.

Male spikes 7-12 mm. l. ....	1. <i>M. microcarpa</i> .
Male spikes 3-5 mm. l. ....	2. <i>M. microstachya</i> .
Leaves with numerous pits.	
Male spikes 8-20 mm. l. ....	3. <i>M. cerifera</i> .

1. *M. microcarpa* Benth. *Plant. Hartw.* 266 (1839); lenticels on branches large, white, apparent; leaves oblanceolate or oblong-lanceolate, cuneate at base, more or less toothed in the upper margin, upper surface not pitted but with a few superficial yellow glands; male spikes 7-12 mm. l.; stamens usually 4, united  $\frac{2}{3}$ - $\frac{3}{4}$  of length.—*Griseb. Fl. Br. W. Ind.* 177 (in part); *Urban in Engl. Bot. Jahrb. xv.* 358; *Cheval. in Mém. Sc. Nat. Cherb. xxxii.* 274. (Fig. 5.)

#### Wax Wood.

*Wright!* *Masson!* *Lindsay!* *Bancroft!* *Macfadyen!* Port Royal Mts., *Purdie!* *March!* *Hartweg!* Blue Mt. Peak, *Prior!* Mountains, 4000 ft. and upwards, J.P. 637, *Hart!* Cinchona, 4500 ft., *Fawcett!* Farm Hill Works, *Harris!* Fl. Jam. 5612, 8152, 8461, 8462, 9138; Cinchona, *G. Nichols!*

Shrub or small tree, 9-15 ft. high. Leaves 3-6 cm. l., 1-2 cm. br., becoming crowded towards end of shoot, with very minute hairs on upper surface which are more apparent on the median nerve, underneath generally pubescent and punctate with numerous yellow glands; lateral nerves at angle of 60°-75° from median, prominent underneath. Bracts of male spikes 1-1.5 mm. l. and br., of fruit-bearing spikes 6-7 mm. l., 8-9 mm. br. Fruit 2.5-3 mm. l., subglobose, crowned with the style-branches.

2. *M. microstachya* Kr. & Urb. in *Engl. Bot. Jahrb. xv.* 361 (1892); lenticels large, white, apparent; leaves oboval-elliptical or oblong-lanceolate, slightly cuneate at base, generally entire, sometimes with 1-3 small teeth which are occasionally on one

side only; upper surface with a few resinous points; male spikes 4–6 mm. l.; stamens 2 or 3.—*Cheval. tom. cit.* 276.

Locality in Jamaica and collector unknown.

Leaves 2·5–3 cm. l., ·9–1·3 cm. br.; internodes 1–3 mm. l., with very minute hairs, disks underneath numerous with yellow glands, lateral nerves at an angle of 65°–70° from median, prominent underneath. Bracts ·4–·5 mm. l., ·5 mm. br. We have not seen a specimen.

3. *M. cerifera* L. *Sp. Pl.* 1024 (1753); lenticels small, not very apparent; leaves lanceolate or lanceolate-linear, long-cuneate at base and attenuated into the petiole, entire or with a few teeth near apex, with numerous pits on upper surface with yellow resin; male spikes 8–20 mm. l.; stamens usually 4–6.—*Urb. tom. cit.* 358; *Cheval. tom. cit.* 261. *M. microcarpa* *Griseb.* *loc. cit.* (in part).

Locality in the island unknown; *Lindsay!*—Cuba, Hispaniola, Porto Rico, Bahamas, Guadeloupe, Bermuda, southern United States.

Shrub or small tree 6–10 ft. high. Twigs hairy or glabrous. Leaves 4–10 cm. l., ·8–1·5 cm. br., adult usually glabrate, but velvety on median nerve on upper surface and sometimes puberulous underneath; pits numerous below with yellow or reddish glands; lateral nerves at angle of 50°–60° from median, not prominent underneath. Fruit small, globose, 3 mm. l. and br.; when ripe covered with waxy papillæ.

Var. *dubia* *Cheval. tom. cit.* 265 (1902); leaves larger, 5–12 cm. l., 1–barely 2 cm. br., lanceolate, generally with 3–5 pairs of large teeth in upper half; surface almost glabrous, with few glands.

Locality in the island unknown; *Lindsay!*—Florida.

#### FAMILY V. JUGLANDACEÆ.

Trees. Leaves alternate, imparipinnate; stipules wanting. Flowers monœcious, male in catkins, female in erect terminal spikes. Male flowers adnate to the bract. Stamens numerous. Female flowers sessile on the rhachis. Perianth epigynous, with 4 teeth or lobes. Ovary 1-celled; style short with 2 stigmatic branches. Ovule solitary, erect from the base, orthotropous. Fruit drupaceous; exocarp fleshy or succulent, endocarp hard, intruded at the base, dividing the fruit into 2 or 4 imperfect cells. Seed solitary, without endosperm. Embryo of the same shape as the seed, with superior radicle.

Species 32 or 33, widely dispersed through the temperate regions of the northern hemisphere, and in the tropics in the mountains of Asia, Central America and the West Indies.

## JUGLANS L.

Perianth of male flowers concrete with the linear bract, the margin irregularly 5-6-lobed. Stamens inserted on the linear receptacle in 2 or several series, the connection of the anthers generally clavate or dilated at the apex but scarcely extending beyond the cells. In the female flowers the bract and bracteoles are adnate to the ovary at the base forming an involucre with margin irregularly 3-5-lobed or toothed. Perianth limb 4-toothed or 4-lobed. Drupe with wrinkled endocarp.

Species 9, with distribution of the family.

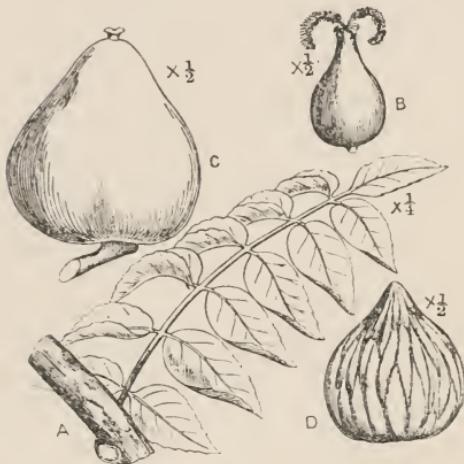


Fig. 6.—*Juglans jamaicensis* C. DC.

A, Leaf (after Descourtilz).

B, Female flower.

C, Fruit.

D, Putamen (B, C, D after Urban).

*J. jamaicensis* C. DC. in DC. *Prodri. xvi. pt. 2*, 138 (1864).—Urb. in *Notizbl. k. bot. Gart. & Mus. Berlin*, i. 29-31, fig. C. E. (1895) & *Symb. Ant.* iv. 193. *J. fraxinifolia* Descourt. *Fl. med. Ant.* vii. 5, t. 453 (1829), non Lam. (Fig. 6.)

Jamaica (*fide* Descourtilz), but not found in recent years.—Hispaniola, Porto Rico.

Leaves 6-9-jugal, leaflets generally alternate, lanceolate, serrate, unequal at base. Female flower, perianth-lobes linear, ovary ovate, acuminate, style-branches long, pendulous. Fruit obversely piriform, about 4 cm. l. and as broad at base; putamen 3-3.5 cm. l., 2.7-3 cm. br., concave at base, acuminate above.

## FAMILY VI. BATIDACEÆ.

A maritime glabrous shrub, with prostrate stems and numerous opposite ascending branches. Leaves opposite, sessile, fleshy, linear or linear-oblong, semiterete, entire. Flowers dioecious, in strobiles which are solitary in the axils. Male flowers: strobile sessile; scales free, tightly imbricate in 4 rows,

persistent, with one flower in each axil. Perianth cup-shaped, transversely 2-lobed above the middle; lobes truncate, the posterior larger, external in bud. Stamens 4, inserted at the base of the perianth, alternating with 4 staminodes. Anthers 2-celled, dehiscing inwardly. Female flowers: strobile stalked, ovoid-oblong, 4-12 flowered. Scales in alternating pairs towards the base of the strobile, small, roundish, deciduous. Perianth wanting. Ovaries ovoid-oblong, each 4-celled, united to form a fleshy compound fruit, the apices free, bearing 2-lobed, sessile stigmas. Ovules solitary in the cells, erect from the base, anatropous. Seeds without endosperm, cotyledons large.

Species 1, a native of tropical America from Florida and the West Indies to Brazil, found also in California and the Sandwich Islands.

### BATIS L.

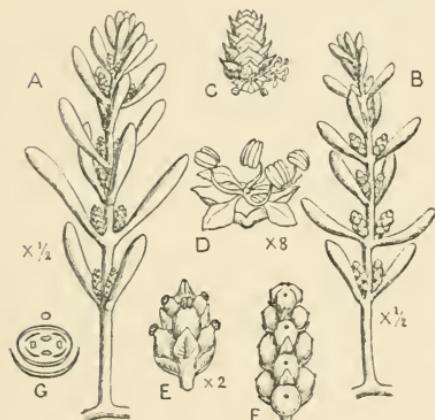


Fig. 7.—*Batis maritima* L.

- A, Branch with male flowers.
- B, Branch with female flowers.
- C, Male spike.
- D, Male flower, stamens and staminodes partially lifted out from the perianth.
- E, Female spike.
- F, Fruiting spike.
- G, Diagram of flower.

**B. maritima** L. *Syst. ed.* 10, 1289 (1759); *Jacq. Sel. Stirp. Amer.* 260, *t.* 40, *f.* 4 & *Amer. Ed. Pict.* 126, *t.* 246; *Griseb. Fl. Brit. W. Ind.* 61; *A. DC. Prodr. xvii.* 35; *Torr. in Smiths. Contrib.* *vi. t.* 11; *K. Schum. in Fl. Bras. iii. pt. 3,* 757, *t.* 126. *Kali fruticosum coniferum flore albo Sloane Cat.* 50, *Hist. i.* 144. *Batis maritima erecta* &c. *Browne Hist. Jam.* 356 (1756). (Fig. 7.)

Barilla, Jamaican Samphire.

Wright! Shakspear! Bromfield! March! Palisadoes; Lime Cay; Fawcett! Ferry River; Great Goat Island; Harris! Fl. Jam. 8187, 9374.—Florida, Texas, Bahamas, Cuba, Hispaniola, Porto Rico, Culebra, St. Thomas, St. Cruz, Martinique, eastern tropical continental America, California, Sandwich Islands.

## FAMILY VII. ULMACEÆ.

Trees or shrubs with a watery sap. Leaves alternate, 3-nerved at base, pinniveined above; stipules lateral, free, generally small, caducous. Flowers (in Jamaican species) unisexual or polygamous, axillary on twigs of the same year, cymose, fasciculate or the fertile solitary. Perianth simple, calycine, lobes or segments imbricate or valvate. Male flowers: stamens as many as the lobes of the perianth and opposite to them; filaments straight or scarcely inflexed at the apex; anthers erect in the bud. Female flowers: ovary superior, one-celled, consisting of a single carpel, sessile; style central, 2-partite, stigmatic on the inner side of the branches. Ovule one, affixed at or under the apex, pendulous, anatropous. Fruit small, globose or ovoid, drupaceous (in Jamaican species) with a hard endocarp. Endosperm wanting or scanty. Embryo curved.

Segments of male perianth imbricate; female perianth deciduous..... 1. *Celtis*.  
 Segments of male perianth induplicate-valvate; female perianth persistent..... 2. *Trema*.

Species 130, natives of both temperate and tropical regions.

## 1. CELTIS L.

Cymes, male or androgynous, solitary or racemose, axillary or at base of young shoots; flowers polygamous, lax or in fascicles; fertile flowers long-stalked, solitary or few, axillary. Perianth 5-(4)-partite, segments imbricate. Embryo with very broad cotyledons.

Species about 60, widely dispersed in temperate and tropical regions, especially in the northern hemisphere.

Leaves very oblique at base. Trees without spines.

Leaves broadly ovate or oval. Fruit pedicel more than twice as long as petioles..... 1. *C. trinervia*.  
 Leaves ovate or ovate-lanceolate. Fruit pedicel usually shorter than the petioles..... 2. *C. Swartzii*.  
 Leaves not oblique at base, oval to oblong-elliptical. Shrub with spines. Fruit pedicel shorter than petioles ..... 3. *C. iguanæa*.

1. *C. trinervia* Lam. *Encyc. iv.* 140 (1797); leaves obliquely and broadly ovate or oval, cuspidate-acuminate, serrate except at base and acumen, teeth mucronulate, base subcordate or round, sometimes acute on one side and occasionally on both sides, minutely scabridulous on the upper surface, sparsely pubescent, at length somewhat glabrate except on nerves; petiole more or less pubescent; male flowers stalked, in fascicles of 3 to 5, on

young shoots on which leaves are just appearing, and which spring from branches without leaves; fertile flowers solitary, stigmas linear, entire; pedicel of drupe more than twice as long as petiole; *Griseb. Fl. Br. W. Ind.* 149 (excl. syn. *C. Swartzii* Planch.). *C. jamaicensis* Planch. in *Ann. Sc. Nat. sér. 3, x.* 290 (1848) & in *DC. Prodr.* xvii. 176. (Fig. 8, A, B.)

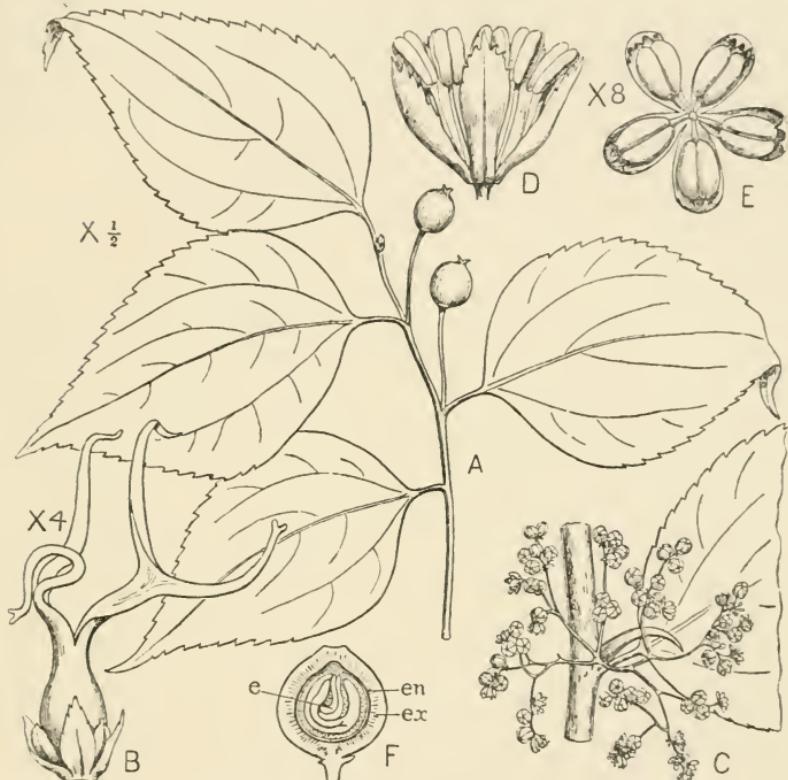


Fig. 8.—*Celtis*.

A, *C. trinervia* Lam., shoot with fruit.

B, *C. iguanæa* Sarg., female flower.

C, Male inflorescence of same.

D and E, Male flower of same.

F, *C. australis* L., fruit cut lengthwise (after Baillon); ex, exocarp; en, endocarp; e, embryo.

*Swartz!* (by error *Shakspear* Planch. loc. cit.) *Macfadyen!* Moneague, *Prior!* Cold Spring near Newcastle; Old England, Blue Mts., 3500 ft.; near Westphalia, Blue Mts., 3800 ft.; Tom's Cave Wood, Upper Clarendon, 2500 ft.; *Harris!* Fl. Jam. 5127, 5495, 7358, 10,857; Grierfield, near Moneague, Britton 2649!—Hispaniola.

Small slender tree 20–30 ft., without spines. Twigs pubescent, at length glabrate. Leaves 6–13 cm. l., 4–6.5 cm. br. Drupe globose-ovoid, attenuated at apex, 1 cm. l.

2. *C. Swartzii* Planch. in *Ann. Sc. Nat. sér. 3, x.* 304 (1848); leaves ovate-lanceolate to ovate, acuminate, serrate except at

base and acumen, generally with one side at base roundish and the other acute, covered on both sides with minute dots, which are black on the under surface, glabrous; petiole slightly pubescent, at length glabrate; flowers in loose axillary cymes male or a few hermaphrodite generally near the apex of the cyme, also fertile flowers sometimes solitary; stigmas linear, entire; pedicel of drupe usually shorter than the petioles.—*C. trinervia* *Planch.* in *DC. Prodr.* *xvii.* 181 (non *Lam.*).

*Wright*! (by error *Swartz* *Planch. loc. cit.*) Old England, Blue Mts.; Cane River Valley, 300 ft.; Round Hill, Santa Cruz Mts., 1500 ft.; Westphalia, Berwick Road; Great Goat Island; Glasgow, near Troy, 1400 ft.; *Harris*! Grove Place, near Mile Gully, 1700 ft., *Britton & Harris*! *Fl. Jam.* 5389, 5495, 9329, 9432, 9620, 9695, 10,622.—Cuba, Hispaniola.

Tree 25–45 ft. high, without spines. *Twigs* very young, pubescent, at length glabrate. *Leaves* 3–8(–11) cm. l., 2–4(–5) cm. br. *Drupe* purple, about as long as, or longer than, the pedicel, 8 mm. l.

3. *C. iguanæa* *Sarg. Silva*, *vii.* 64 (1895); a spiny shrub; leaves not oblique at base.—*C. aculeata* *Sw. Prodr.* 53 (1788); *Fl. Ind. Occ.* 545; *Griseb. Fl. Br. W. Ind.* 149; *Planch. in DC. Prodr.* *xvii.* 186; *Hemsl. in Salv. & Godm. Biol. Am. Cent. Bot. iii.* 138. *Rhamnus Iguanaeus* *Jacq. Enum. Pl. Carib.* 16 (1760); *Commel. Amst. t. 73*; *Cav. Icon. t. 294*. *Mertensia zizyphoides* *Kunth in H.B. & K. Nov. Gen. & Sp. ii.* 31 (1817). *M. lœvigate* *Kunth loc. cit. t. 103.* (Fig. 8, C–E.)

*Macfadyen*! Pedro Plain, Purdie! Browns Town, Prior! Grove Place, near Mile Gully, 1700 ft., *Britton & Harris*! *Fl. Jam.* 10,619.—Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, Dominica, Bequia, Margarita, Mexico, Panama, Venezuela, Brazil, Colombia, Bolivia, Peru.

Shrub, often climbing high by means of its recurved spines, glabrous; spines in axils of leaves and branches, sometimes geminate. *Leaves* oval to oblong-elliptical, shortly acuminate, entire or with a few teeth above the middle, at base generally slightly cordate, usually covered on both sides with minute dots, 10–12 cm. l., 3–5 cm. br. *Flowers* in short or paniculate axillary cymes; stigmas linear, bifid. *Drupe* 14 mm. l., much longer than pedicel which is shorter than petioles, solitary, axillary.

## 2. TREMA Lour.

Flowers polygamous, the fertile often bearing stamens, in axillary cymes. Male flowers: perianth, 5(–4) partite, segments induplicate-valvate or scarcely slightly imbricate; ovary rudimentary. Fertile flowers: segments of perianth persistent, slightly imbricate. Receptacle generally pilose. Drupe surrounded by the persistent perianth and generally crowned with the involute branches of the style; endosperm fleshy, generally scanty; embryo with cotyledons narrow.

Species 30 or less, widely dispersed throughout the tropics and subtropics.

Leaves 7-12 cm. l., lanceolate-oblong, subcordate, underneath pubescent or glabrescent with network of veins not prominent ..... 1. *T. micrantha*.

Leaves 2-6 cm. l., elliptical-lanceolate or ovate-lanceolate, underneath tomentose and with network of veins prominent ..... 2. *T. lima*.

1. *T. micrantha* Bl. in *Mus. Bot. Lugd. Bat.* ii. 58 (ca. 1853); leaves lanceolate-oblong, acuminate, 7-12 cm. l.; underneath with nerves prominent but network of veins not evident.—*Rhamnus* an *Zizyphus*? *arborescens* &c. *Browne Hist. Jam.* 173, t. 12, f. 2. *Rhamnus inermis* foliis ovato-lanceolatis *Plum.*

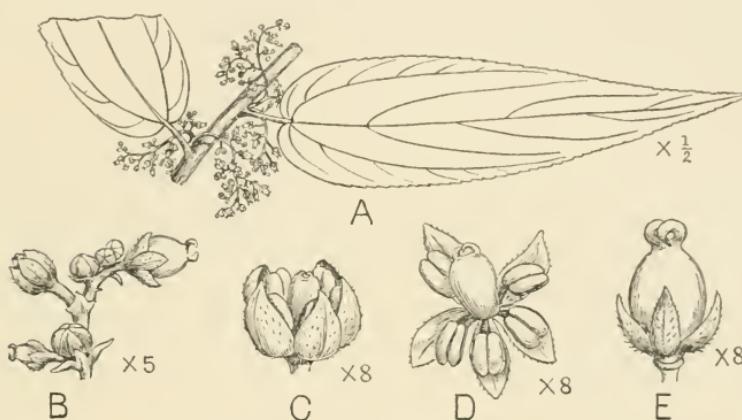


Fig. 9.—*Trema micrantha* Bl.

A, Portion of branch with inflorescence. C, D, Hermaphrodite flowers.  
B, Portion of cyme. E, Fruit.

*Pl. Amer. (Burm.)* t. 206, f. 1. *Rhamnus micranthus* L. *Syst. ed.* 10, 937 (1759). *Celtis micranthus* Sw. *Prodr.* 53 (1788) & *Fl. Ind. Occ.* 547. *C. lima* Sw. *Prodr.* 53 (1788) & *Fl. Ind. Occ.* 549. *Sponia micrantha* Dcne. in *Nouv. Ann. Mus. Paris* iii. 498 (1834); *Griseb. Fl. Br. W. Ind.* 150; *Plauch. in DC. Prodr.* xvii. 203; *Miq. Stirp. Surinam.* 195, t. 57. (Fig. 9.)

Bass Cedar, Jamaican Nettle Tree.

Plantain Garden River, *Browne*, *Wright!* Blue Mts., *Purdie!* St. Mary, *Hartweg!* St. Mary, *McNab!* *Wilson!* *March!* St. Ann's Bay, *Prior!* near Latimer River, Cinchona; near Greenwich, Blue Mts.; J.P. 1382, 1439; *Hart!* Cane River Valley, 300 ft.; near Beaufort, Westmoreland, 1400 ft.; *Harris!* *Fl. Jam.* 9627, 9885.—West Indies and continental tropical America.

Tree 10-25 (60) ft. high. Twigs pubescent. Leaves ovate-lanceolate, at base slightly oblique, cordate or obtuse, upper surface rough, underneath pubescent especially on the nerves or glabrescent, generally 2·5-4 cm. br. Cymes 2 or 3 branches from axils, as long as, or twice as long as, the petiole. Flowers greenish-yellow. Drupe ovoid, quite glabrous, about 3 mm. l.

2. *T. lima* *Bl. loc. cit.* (ca. 1853); leaves elliptical-lanceolate or ovate-lanceolate, 2-6 cm. l., tomentose, with network of veins prominent.—*T. Lamarckianum* *Bl. loc. cit.* *Loti arboris folio angustissimo &c.* *Sloane Cat.* 163 & *Hist. ii.* 80. *Rhamnus foliis ovato-oblongis* *Plum Pl. Amer. (Burm.) t. 206, f. 2.* *Celtis lima* *Lam. Encyc. iv.* 140 (1797) (non *Sw.*). *Sponia Lamarckiana* *Dene. loc. cit.* (1834); *Griseb. loc. cit.*; *Planch. tom. cit.* 204.

“ Rio Cobre near St. Jago de la Vega”; Seven-mile Walk; on road to Guanaboa, *Sloane*; *Wright!* *Caley!* *Macfadyen!* Green Valley, J.P. 649, 1274, *Morris!* Ginger Piece, Blue Mts.; Robertsfield, 2000 ft.; *Harris!* Fl. Jam. 5124, 6508.—Bermuda, Bahamas, Gr. Cayman, Cuba, Hispaniola, Porto Rico, Guadeloupe, Dominica, Martinique, St. Vincent.

Shrub or small tree, 10-20 ft. high. Twigs pubescent. Leaves at base subequal or oblique, sometimes more or less cordate on one side only, on the upper surface tuberculate to very rough, 7-2 (-4) cm. br. Cymes short. Drupe ovoid, glabrous, about 3 mm. l.

### FAMILY VIII. MORACEÆ.

Trees or shrubs, generally with milky juice, rarely (in *Dorstenia*) herbs. Leaves alternate, entire, toothed or palmatislobed, stipulate. Flowers unisexual. Perianth simple, calycine, small, segments imbricate or valvate; or in the female flower almost closed; or perianth wanting. Male flowers: stamens generally as many as the lobes of the perianth and opposite to them. Female flowers: ovary superior or more or less inferior, one-celled, consisting of a single carpel. Style undivided, 2-toothed or 2-partite. Ovule solitary, sometimes pendulous, anatropous, sometimes erect, orthotropous. Fruit indehiscent, one-seeded, free or variously combined in a pseudocarp of which the receptacle may form part. Seed with little or no endosperm. Embryo often curved, with generally thick, often unequal, cotyledons.

Species more than 900, widely distributed through the temperate and tropical regions.

Flowers spicate, male spikes lax or interrupted, female short, few-flowered .....	1. <i>Trophis.</i>
Male flowers in catkins, female in capitula .....	2. <i>Chlorophora.</i>
Male and female flowers together on the surface of a flattened receptacle .....	3. <i>Dorstenia.</i>
Male flowers in unisexual globose involucrate receptacles, female flower solitary on its involucrate receptacle .....	4. <i>Pseudolmedia.</i>
Flowers in androgynous globose receptacles, male numerous, female solitary in the centre .....	5. <i>Brosimum.</i>
Male and female flowers enclosed in a fleshy globose receptacle with a small opening .....	6. <i>Ficus.</i>
Male and female flowers together on a spike, spikes several together enclosed at first within a spathiform bract .....	7. <i>Cecropia.</i>

## 1. TROPHIS L.

Trees. Leaves stalked, underneath prominently pinniveined and reticulate; stipules lateral, very small, caducous. Flowers dioecious, in spikes. Spikes solitary or geminate in the axils, the male with numerous flowers, the female short, few-flowered. Male flowers: perianth 4-fid, valvate. Filaments inflexed in

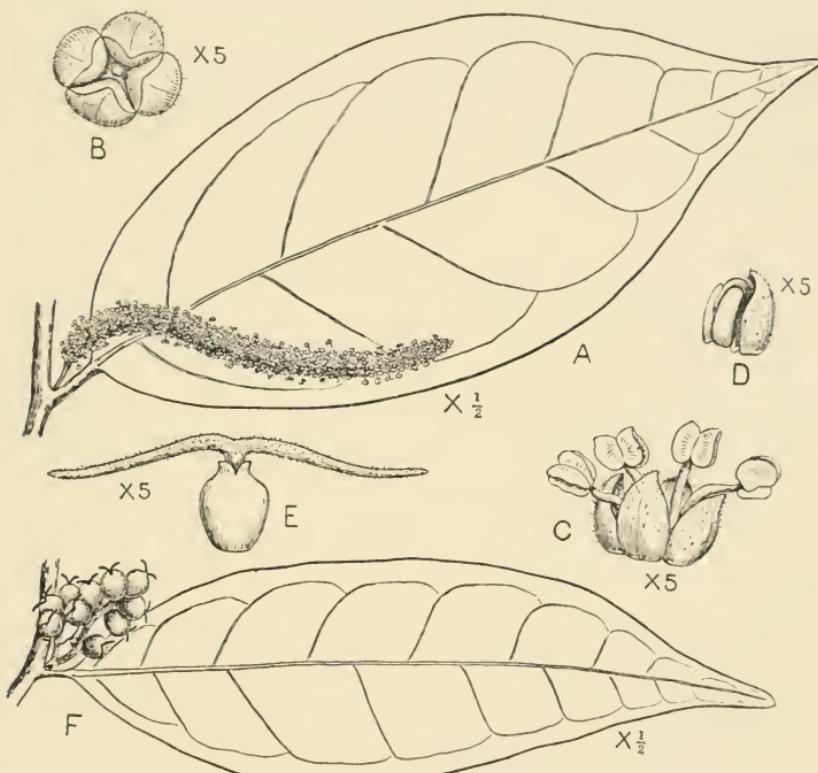


Fig. 10.—*Trophis racemosa* Urb.

A, Leaf with male spike.

B and C, Male flowers; B, unopened; C, after expansion of stamens.

C, after expansion of stamens.

D, Perianth segment with inflexed stamen.

E, Female flower.

F, Leaf with fruiting spike.

bud, afterwards straight, exserted. Ovary rudimentary. Female flowers: perianth tubular, adnate to ovary, contracted at the apex of ovary to form a 4-dentate limb. Style 2-partite; ovule pendulous. Fruit globose, fleshy. Embryo straight; cotyledons fleshy, equal, semiglobose; radicle very short, superior.

5-6 species in the West Indies, Mexico, and the Andes of S. America.

*T. racemosa* Urb. *Symb. Ant. ir.* 195 (1905). *T. foliis* &c. *Browne Hist. Jam.* 357, *t. 37, f. 1.* *T. americana* L. *Syst. ed.* 10, 1289 (1759) & *Amaen. v.* 410; *Griseb. Fl. Br. W. Ind.* 153. *Bucephalon racemosum* L. *Sp. Pl.* 1190 (1753); *Plum. Pl. Amer. (Burm.) t. 67, f. 1.* (Fig. 10.)

R a m o o n.

*Wright!* *Dancer!* *Swarlz!* *St. Mary, McNab!* *Wilson;* *Moneague, Prior!* *March;* *Hanover, J.P. 1288, Morris!* *near Gordon Town, Moore!* *Hall's Delight;* *Cedar Hurst;* *Kentucky Hill, Bluefield Mt., 2000-2500 ft.;* *Tom's Cave Wood, Upper Clarendon, 2500 ft.;* *Harris!* *Fl. Jam.* 5550, 6075, 10,211, 10,858; *near Port Antonio, Britton,* 2598!—*Cuba, Porto Rico, Hispaniola, Mexico, Guatemala, Panama, Colombia, Peru.*

*Tree to 40 ft. high. Leaves elliptical, shortly acuminate, entire, glabrous, 1-2 dm. l., 4-8 cm. br.; nerves 6-8 on each side, arched. Male spikes 5-10 cm. l. Female spikes 8-2 cm. l. Berries 8-12 mm. l.* (fide Grisebach).

Leaves and twigs used as fodder for cattle.

## 2. CHLOROPHORA Gaudich.

Trees with yellow milky juice, with or without spines. Leaves stalked, entire or toothed, pinniveined; stipules lateral, caducous. Flowers diœcious. Male flowers in catkins, dense, rather long, with small bracts. Perianth 4-partite, segments broad, obtuse, slightly imbricate. Filaments inflexed in bud, later straight and

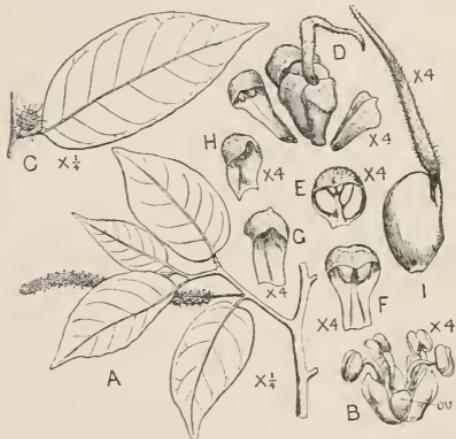


Fig. 11.—*Chlorophora tinctoria*  
Gaudich.

- A, Shoot with male catkin.
- B, Male flower; *ov.* rudimentary ovary.
- C, Leaf with inflorescence.
- D, Portion of female inflorescence dissected, showing flower with enveloping bracts.
- E, F, Gland-bearing bracts.
- G, H, Outer and inner perianth segments.
- I, Pistil.

exserted. Ovary rudimentary. Female flowers in capitula which are globose in W. Indian species. Bracts similar to the segments of the perianth, sometimes thickened inside at the apex with two glands. Perianth deeply 4-fid or 4-partite, segments thickened at the apex, concave, imbricate. Ovary included, oblique; style lateral, filiform, with a long stigmatic surface, undivided; ovule laterally affixed, descending. In fruit the

perianths become somewhat fleshy, and are tightly crowded together into a globose compound pseudocarp. Achene about equal to the perianth, ovate, compressed, very oblique at the apex; pericarp coriaceous. Embryo with ovate equal cotyledons.

Species 2, one a native of tropical America, the other of tropical Africa.

**C. tinctoria** *Gaudich.* in *Freyc. Voy. Bot.* 508 *in nota* (1826). *Morus fructu viridi ligno sulphureo tinctorio Sloane Cat.* 128 & *Hist. ii.* 3, *t.* 158, *f.* 1. *Morus &c. Plum. Pl. Amer. (Burm.)* *t.* 204; *Browne Hist. Jam.* 339. *Morus tinctoria L. Sp. Pl.* 986 (1753); *Wright Mem.* 303. *Maclura tinctoria D. Don ex Steud. Nomencl. ed. 2. ii.* 87 (1841); *Miq. in Fl. Bras. ir. pt. 1.* 155. *t.* 51, 52; *Griseb. Fl. Br. W. Ind.* 153. *M. xanthoxylon Endl. Gen. Suppl. ir. II.* 34 (1847); *Miq. tom. cit.* 156, *t.* 53; *Griseb. loc. cit.* (Fig. 11.)

#### Fustic Tree.

"Plains of the north and south sides of the Island," *Sloane Herb.* v. 52a, 54! *Wright!* *Macfadyen!* *Distin!* *Cuming!* St. Ann; *Liguanea Plain*; *Purdie!* *Bromfield!* *Fairfield*, *Wullschaegel*, 1381b! *Rock Fort*, *Campbell!* *Hope Grounds*; *Sheldon*; *Harris!* *Fl. Jam.* 5281, 6504.—W. Indies and tropical America.

*Tree* to more than 60 ft. high, twigs with light-brown bark. *Leaves* distichous, limb 5-12 cm. l., 1·5-5 cm. br., elliptical, ovate-elliptical or lanceolate, entire or toothed, acuminate. *Berries* as large as a raspberry.

*Male spike* 3-7 cm. l., stalk 1-1·5 cm. l. *Female inflorescence* 6-8 mm. in diam., stalk 3-5 mm. l. *Fruit* 12-14 mm. in diam., stalk 10-12 mm. l.

*Tree* yields a yellow or yellow-brown, very tough, close-grained and heavy-timber which is exported as a dye-wood, and used locally for mill-rollers, naves for wheels, &c.

### 3. DORSTENIA L.

In the West Indies the species are stemless herbs with membranous leaves, with long flat stalks springing from a thickened perennial rhizome. Stipules lateral, distinct, persistent. Flowers monœcious, densely crowded on a scape-like long-stalked saucer-shaped androgynous receptacle. Perianths of both sexes more or less connate into a fleshy layer clothing the surface of the receptacle, forming unisexual pits. Male pits slightly immersed. Stamens 2, filaments at first inflexed, at length straight, exserted. Ovary rudimentary. Female pits much deeper. Ovary enclosed; style lateral, bifid; ovule pendulous. Fruits small, at length protruded from the pits; exocarp somewhat fleshy, endocarp crustaceous. Cotyledons subequal, contortuplicate.

Species about 50, natives of tropical America and Africa, only one in Asia in eastern India.

Leaves cordate.....	1. <i>D. cordifolia</i> .
Leaves peltate .....	2. <i>D. jamaicensis</i> .

1. *D. cordifolia* Sw. *Prodr.* 31 (1788); leaves cordate.—*Sw. Obs. Bot.* 51, t. 7, f. 2 & *Fl. Ind. Occ.* 275; *Griseb. Fl. Br. W. Ind.* 154. (Fig. 12.)

Near Dolphin Head, *Purdie*! Near YS, *Wullschaegel*, 1816! Tyre, near Troy, 2400 ft.; road from Askenish to Dolphin Head, 1000 ft. *Harris*! *Fl. Jam.* S690, 8808, 9266.

*Rhizome* nodose, long, rooting along its whole length. *Leaves* ovate-roundish, ovate or elliptical, cordate at base, apex obtuse, rough, sometimes with scattered tuberculate hairs above, pubescent underneath on the nerves, limb 3-6.5 cm. l., 2-4.5 cm. br.; petioles 4.5-12.5 cm. l., slender, pubescent. *Receptacles* peltate, 8-10 mm. in diam.; margin with about 12 teeth, 2 mm. l., underneath rough with short rigid hairs; female flowers in the centre, male flowers near the margin of the receptacle, peduncle about 2 cm. l.

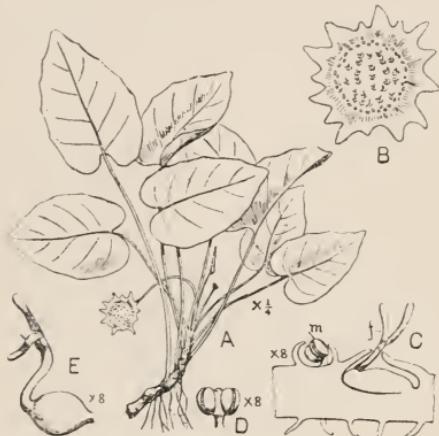


Fig. 12.—*Dorstenia cordifolia* Sw.

A, Plant.

B, Inflorescence seen from above.

C, Section through portion of receptacle showing male (m) and female (f) flowers.

D, Stamen.

E, Pistil.

2. *D. jamaicensis* Britton in *Torr. Bot. Cl. Bull.* xxxv. 567 (1908); leaves peltate.

On vertical limestone cliffs, Somerset, Manchester, *Britton* 3737; *Harris* & *Britton*! *Fl. Jam.* 10,607.

*Rhizome* erect, about 2 cm. l., 5 mm. br. *Leaves* ovate to ovate-roundish, peltate below the middle, papillose-rough above, shortly tomentose underneath, limb 3-5 cm. l., 1.5-4 cm. br.; petioles 3-12 cm. l., pubescent. *Receptacles* peltate, 8-10 mm. in diameter, purplish, puberulent, margin with about 20 teeth .5 mm. l.; peduncle about 2 cm. l.; flowers dark-purple.

#### 4. PSEUDOLMEDIA Tréc.

Trees with milky juice. Leaves shortly stalked, entire, thinly coriaceous, pinniveined; stipules intrapetiolar, small, very caducous. Flowers dioecious, male in sessile axillary capitula, female solitary, sessile, axillary, the receptacle of both sexes involucrate with bracts in several series. Male flowers: perianth wanting. Stamens (each representing a flower) numerous on a

receptacle within the involucre, intermixed with narrowly stalked spathulate scales. Female flower: perianth tubular with a small toothed opening at the apex. Ovary enclosed, adnate at the base on one side; style with two stigmatose exserted branches; ovule pendulous. Fruit ovoid, enclosed by the increased some-

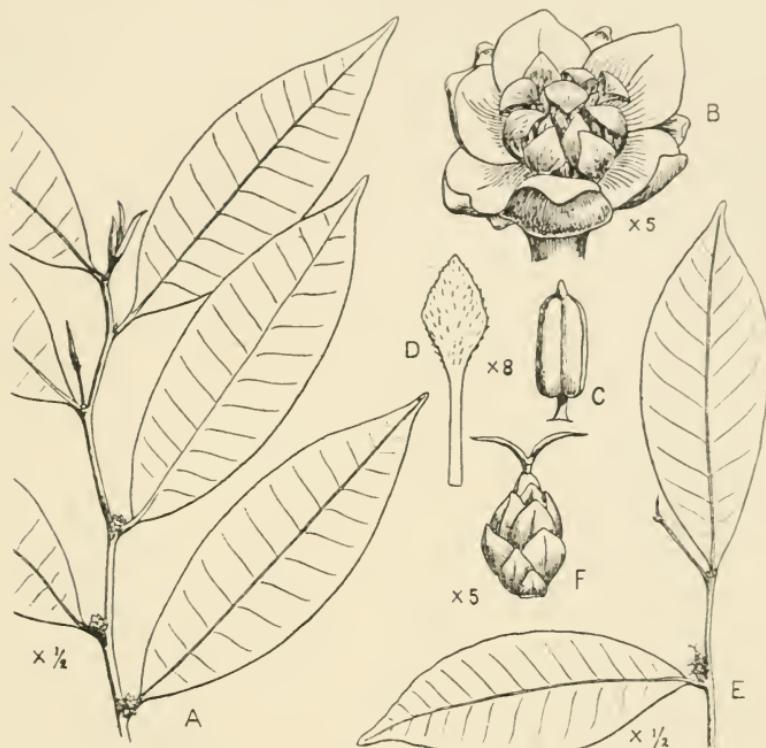


Fig. 13.—*Pseudolmedia spuria* Griseb.

A, Male shoot.

B, Male inflorescence with involucre.

C, Stamen.

D, Spathulate scale from the receptacle.

E, Female shoot.

F, Female inflorescence.

what fleshy perianth. Pericarp crustaceous. Cotyledons thick, fleshy, very unequal.

Species 5, in the West Indies, Central America and on the Andes.

*P. spuria* Griseb. *Fl. Br. W. Ind.* 152 (1859). *P. havanensis* Tréc. in *Ann. Sc. Nat. sér. 3, viii.* 130, *t. 5, f.* 149–154; Pittier in *Contr. U.S. Nat. Herb.* *xiii.* 432. *Arbor foliis &c.* Browne *Hist. Jam.* 369. *Brosimum spurium* Sw. *Prodr.* 12 (1788), *Fl. Ind. Occ. 20 & Ic. ined. t. 27.* (Fig. 13.)

Bastard Breadnut, Milkwood.

Wright! Browns Town, Prior!—Cuba, Porto Rico, Panama.

A high tree 25-50 ft., glabrous. Leaves elliptical-oblong, abruptly acuminate, 10-14 cm. l., 3-4.5 cm. br.; stalk 3-6 mm. l. Female receptacles generally geminate in axil; flower 2.5 mm. l.; exserted branches of the style 4 mm. l. Fruit 1 cm. l., narrowly ellipsoidal.

5. **BROSIMUM** Sw.

Trees with milky juice. Leaves shortly stalked, entire, leathery, pinniveined; stipules lateral, small, very caducous.

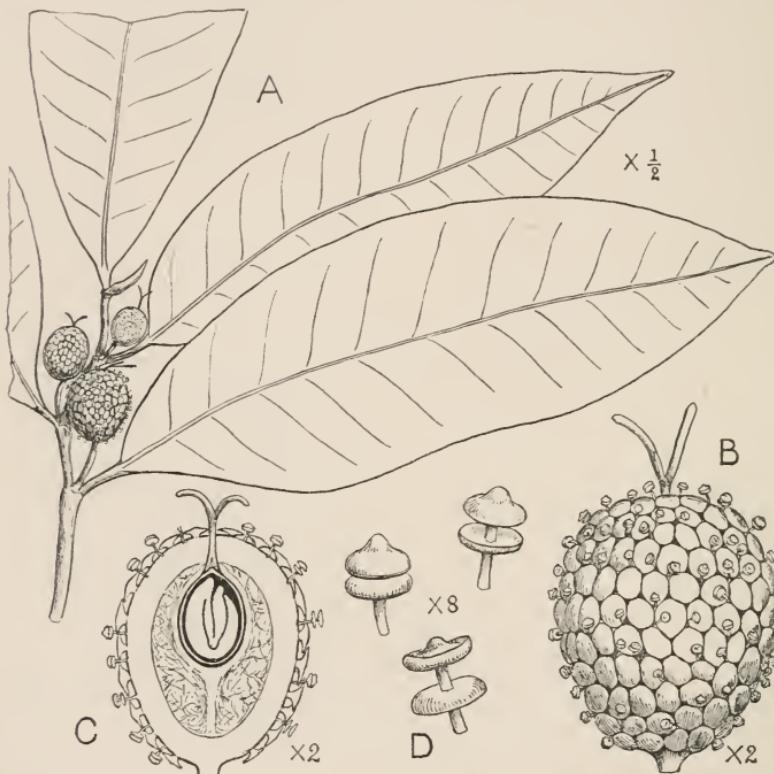


Fig. 14.—*Brosimum alicastrum* Sw.

A, Shoot with inflorescences.

B, Inflorescence.

C, Same, cut lengthwise.

D, Stamens in various stages of dehiscence.

Flowers monocious or dicecious by abortion, without perianth, attached to globose androgynous receptacles, which are generally geminate in the axils. Male flowers reduced to a single stamen, numerous, separated by peltate bracts covering the receptacle. Female flower immersed in the centre of the receptacle, solitary, or occasionally 2, style exserted with two stigmatose branches; ovule pendulous. Fruit globose, enveloped in the fleshy receptacle.

Seed attached near the apex, without endosperm; cotyledons thick, fleshy, subequal; radicle small, superior.

Species about 8, natives of tropical America, from the West Indies and Mexico to Brazil.

**B. Alicastrum** Sw. *Prodr.* 12 (1788) & *Ic. ined.* t. 26; *Tussac Fl. Ant.* i. 86, t. 9; *Wright Mem.* 301; *Trécul in Ann. Sc. Nat. sér. 3, viii.* 139, t. 6, f. 163-5; *Griseb. Fl. Br. W. Ind.* 152. *Alicastrum* &c. *Browne Hist. Jam.* 372. (Fig. 14.)

Bread-nut.

*Wright!* *Lindsay!* *Browne!* *Swartz!* *Harris!* *Fl. Jam.* 10,406.—Mexico.

A high tree. Leaves oblong or elliptical-oblong, cuspidate, glabrous, 7-18 cm. l., 3-6 cm. br.; stalks 3-10 mm. l. Receptacles covered with flowers about 5-1 cm. l.; peduncles 3-1 cm. l. Stamens peltate, 1-celled, dehiscing all round. Fruit globose, yellow, about the size of a small plum, 2-2.5 cm. l.

An excellent timber tree. Nuts and leaves form a valuable fodder.

## 6. FICUS L.

Trees with milky juice. Leaves alternate, entire, conspicuously pinnately veined; stipules enclosing the terminal bud,

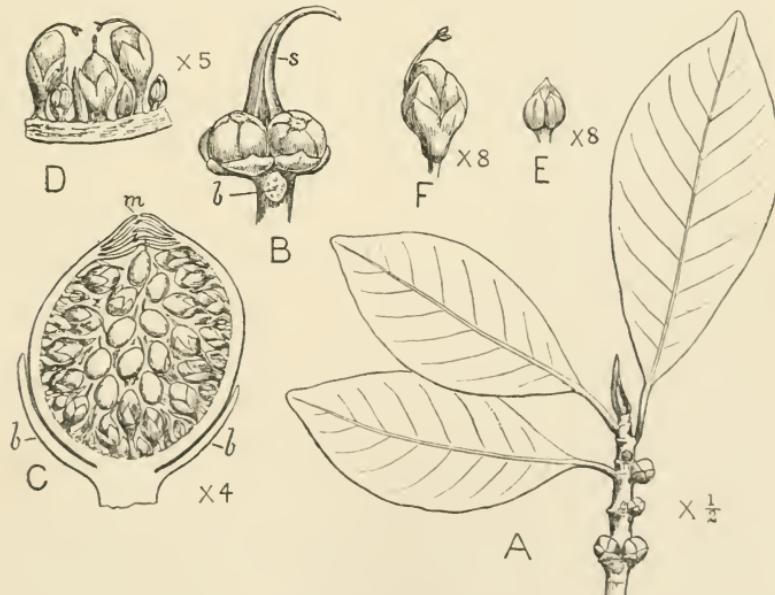


Fig. 15.—*Ficus aurea* Nutt.

A, Branch with young figs.  
 B, Apex of shoot with two figs; s, stipule; l, leaf-scar.  
 C, Vertical section of fig; b, basal bracts; m, mouth.  
 D, Section of small portion of fig showing flowers.  
 E, Male flower.  
 F, Female flower.

caducous. Flowers monoecious, sessile on the inside of a hollow fleshy globose axillary receptacle (the fig), which is androgynous and has scales at the small mouth, and an involucre of bracts at the base. Male flowers: perianth-segments 3, imbricate. Stamen solitary or two. Female flowers: perianth-segments 4-6. Ovary straight; style simple; ovule pendulous. Achenes enclosed in the receptacle. Seed pendulous; embryo curved; cotyledons equal or unequal, radicle incumbent above.

F i g.

Species about 600, widely dispersed through the warmer regions of the world, but in America almost confined to the tropics.

Figs solitary in axils ..... 1. *F. suffocans*.  
 Figs two in each axil.  
   Figs surrounded half-way up with broad bracts  
     forming a cupule..... 2. *F. Harrisii*.  
   Figs with bracts not cupular nor extending half-way.  
     Figs sessile or subsessile.  
       Mouth not prominent ..... 3. *F. aurea*.  
       Mouth mammiform.  
         Bracts at base of figs not fimbriate..... 4. *F. mamillifera*.  
         Bracts fimbriate ..... 5. *F. Berteroii*.  
   Figs stalked.  
     Mouth immersed.  
       Figs globose or depressed-globose, soft, mouth  
         not in an umbo.  
         Figs globose, 8-15 mm. in diam..... 6. *F. ochroleuca*.  
         Figs depressed-globose or longer than  
           broad, 20-30 mm. in diam.  
           Figs longer than broad; leaves tripli-  
             nerved ..... 7. *F. Halliana*.  
           Figs broader than long; leaves not  
             triplinerved ..... 8. *F. morantensis*.  
         Figs obovoid, hard, mouth immersed in an  
           umbo ..... 9. *F. Grabhamii*.  
     Mouth not immersed.  
       Leaves generally subauriculate at the cuneate  
         base; bracts connate ..... 10. *F. Wilsonii*.  
       Leaves not auriculate at base; bracts scarcely  
         connate ..... 11. *F. populnea*.

§ 1. Figs solitary in the axils. Male flowers with 2 stamens.

1. *F. suffocans* Griseb. *Fl. Br. W. Ind.* 150 (1859); twigs terete, not furrowed, glabrous; stipules glabrous; leaves parchment-like, dotted with cystoliths on both sides, elliptical or oblong, base rounded, obtuse or subacute, sometimes a little oblique, apex obtuse or bluntly apiculate, glabrous, at base shortly 3-(5-)nerved; figs globose, plum-like, shortly stalked, glabrous, mouth not prominent.—*Warb. in Urb. Symb. Ant. iii.* 485. *Ficus Indica maxima* folio &c. *Sloane Cat.* 189, *Hist. ii.* 140,

*t. 223. F. laurifolia Griseb. loc. cit.* (in part, with reference to the Jamaican specimen, non *Lam.*).

Moneague, *Prior!* *Wilson*; Claverty Cottage, Blue Mts., J.P. 1455, *Hart!* Blue Mts.; Ferry River; Troy, 1600 ft.; Shaftston, Westmoreland, 200 ft.; *Harris!* Big Level, John Crow Mts., *Harris & Britton!* Fl. Jam. 5177, 8259, 9445, 9974, 10,698.—Cuba.

*Tree* 40-60(-100) ft., spreading. *Leaves* 9-20 cm. l., 3·5-8 cm. br.; basal nerves ascending, nerves 6-9 on each side, underneath very prominent, with others much more slender alternating; petioles 5-3 cm. l.; stipules 8-15 mm. l. *Figs* when dry 1·5-2·5 cm. br., blackish; when living 3 cm. br., yellow; peduncle 7 mm. l., glabrous.

The specimen Fl. Jam. 10,698 was taken from a tree 100 ft. high, trunk 4 ft. in diameter with far-extending buttresses.

§ 2. Figs two together in the axils. Male flowers with one stamen.

2. *F. Harrisii Warb.* in *Urb. Symb. Ant.* *iii.* 457 (1903); branches thick, scars of leaves and figs prominent, stipules pilose; leaves large, regularly parchment-like, glabrous, broadly elliptical, cordate, apex subapiculate, pinninerved, the first pair of nerves springing from the base of the midrib; figs sessile, a little depressed, silky-puberulous, surrounded as far as the middle with bracts connate into a cupule; the small mouth not prominent.—*F. crassinervia Griseb. loc. cit.* (in part).

*Macfadyen!* Sheldon, Blue Mts.; Troy, 1600 ft.; *Harris!* Fl. Jam. 5221, 9459, near Moneague, *Britton*, 2686!—Cuba.

A very large *tree*. *Leaves* 12-22 cm. l., 9-13 cm. br., 7-9 veins on each side; petioles 5-8 cm. l.; stipules 1 cm. l., densely covered with adpressed silky hairs. *Figs* 13 mm. l., 15 mm. br.; mouth scarcely 1·5 mm. in diam., closed by broad scales, surrounded by a distinct ring. *Cupule* 5 mm. high, pubescent outside.

3. *F. aurea Nutt.* *Sylva ii.* 4 (1846); glabrous, leaves somewhat leathery, elliptical, sometimes somewhat ovate or obovate, base rounded or subacuminate, apex very shortly apiculate, subobtuse; figs sessile, depressed-globose, pea-like, with large broad bracts at the base; mouth rather large, closed by somewhat prominent scales.—*Sarg. Silva vii.* 95, t. 324; *Warb. tom. cit.* 460; *Britton Bull. N. York Bot. Gard.* *iv.* 116. *F. sapotæfolia Kunth & Bouché Ind. Sem. hort. Berol.* 1846, 17, No. 26; *Warb. loc. cit.* *F. dimidiata Griseb. op. cit.* 151 (1859). (Fig. 15.)

Fairfield, *Wullschlaegel*, 1878! Sea-coast, Negril, *Harris!* Fl. Jam. 10,218.—Florida, Key West, Babamas, Gr. Cayman, Cuba, Hispaniola.

*Tree* 12-60 ft. (Fl. Jam. 10,218 is described as “a very large tree, lateral limbs extending for a distance of 75 ft. from the trunk, which is about 6 ft. in diameter”). *Twigs* scarcely furrowed, with small oblong lenticels. *Leaves* 6-15 cm. l., 2·5-8·5 cm. br., midrib underneath, often glandular at the base, nerves 6-10 on each side; petioles 1-3·5 cm. l.; stipules 1-1·5 cm. l. *Figs* (ripe) red, (when dry) greyish-brown, or yellow, to 8 mm. l., to 1 cm. br.; bracts 3-5 mm. l.; mouth, 2-3 mm. br.

4. *F. mamillifera* Warb. *tom. cit.* 470 (1903); twigs (when dry) furrowed; stipules glabrous or puberulous; leaves parchment-like, glabrous, broadly- or ovate-elliptical, apex rounded, base rounded or subcordate; petioles short; figs globose or depressed-globose, commonly smaller than a cherry, glabrous, with bracts large, glabrous or puberulous, forming a shallow cupule; peduncle short, or wanting; mouth mamilliform, very prominent, not surrounded by a ring.—*F. trigonata* Griseb. (non L.) ex mss. in Herb. Edinb. (St. Mary, McNab).

Agualta Vale, St. Mary, McNab! Fairfield, *Wullschaegel*, 1349! March! Robertsfield; Sheldon, Tweedside, South St. Andrew; near Cinchona; near Beaufort, Westmoreland, 1300 ft.; Bluefields; Harris! Bath, Harris & Britton! Fl. Jam. 5206, 5348, 5396, 8594, 9913, 10,198, 10,581.

Large tree, 40 ft. high. Leaves 7-12 cm. l., 4-8 cm. br., with white dots on upper surface; midrib underneath sometimes glandular at the base; nerves 6-9 on each side, more slender parallel nerves often intervening; petioles 8-28 mm. l.; stipules 8-12 mm. l. Figs 8-15 mm. l., 10-12 mm. br.; peduncles 1-3 mm. l.; basal bracts 3-4 mm. l., roundish, glabrous, not fimbriate; mouth 2 mm. in diam., 1.5-2 mm. high, closed by blackish scales.

Var. *hirsuta* Fawc. & Rendle in *Journ. Bot. l.* 177 (1912); stipules puberulous, hirsute on the back; bracts hirsute, figs smaller, 7 mm. l., 11 mm. br.

Grierfield, near Moneague, Britton, 2364!

5. *F. Bertero* Warb. *tom. cit.* 468 (1903); twigs not thick, (when dry) sulcate or the younger angular; stipules glabrous; leaves membranous, glabrous, ovate or elliptical, apex rounded or obtuse, base commonly subcordate, rarely rounded; basal nerves 5-7, short, the upper scarcely different from the other nerves in direction and habit; petioles proportionally short; figs somewhat depressed-globose, smaller than a cherry, glabrous, with 2-3 bracts, slightly connate, glabrous, minutely fringed on the margin; peduncle thick, small or minute; mouth mamilliform, slightly prominent, not surrounded by a ring.—*F. laurifolia* Griseb. *op. cit.* 150 (in part, non Lam.).

*Bertero.*

Twigs 2-4 mm. br., (when dry) reddish-grey. Leaves 13-17 cm. l., 7-10 cm. br.; nerves on each side, besides the basal nerves, 7-9, above very slightly prominent, underneath prominent, spreading, almost straight; veins only underneath slightly prominent; reticulation very delicate, only distinct underneath; petioles 2-3 cm. l., glabrous; stipules 1.5-2 cm. l., lanceolate, acute, (when dry) red. Figs 8 mm. l., to 1 cm. br., yellow (when dry), sessile or subsessile; basal bracts 2-4 mm. l.; mouth 2 mm. br.—Description after Warburg; we have not seen any specimen.

6. *F. ochroleuca* Griseb. *op. cit.* 151; stipules minutely puberulous or almost glabrous; leaves parchment-like, glabrous, finely dotted with cystoliths on both sides, elliptical-oblong to

lanceolate-oblong, base subacute to rounded, apex acute to acuminate, lateral nerves 8-12, spreading, almost straight; figs globose, glabrous, with two bracts at base, slightly connate, puberulous; mouth deeply immersed, surrounded by a slightly elevated ring.—*Warb. tom. cit. 464* (in part). F. Fadyeni *Miq.* in *Ann. Mus. Bot. Lugd. Bot. iii.* 219 (1861).

*Swartz!* *Macfadyen*; *Moneague, Prior!* *March!* near Troy, 1500 ft.; Malvern, 2200 ft.; near Darliston, 600 ft.; *Harris!* Fl. Jam. 9067, 9664, 9873; Grierfield, near Moneague, *Britton*, 2646, 2683!

Tree 25-35 ft. high. Leaves 6-10 cm. l., 2.5-4 cm. br.; petioles 1-2 cm. l.; stipules 5-1 cm. l. Figs 1-1.2 cm. in diam.; peduncles 7-1 cm. l.; basal bracts round, 1.5 mm. l.; mouth 2 mm. in diam.

7. **F. Halliana** *Britton* *Mss.*; stipules glabrous or sometimes minutely puberulous; leaves papery, (when dry) glabrous, tripli-nerved, dotted with cystoliths on both sides, elliptical-oblong, acuminate, base rounded, lateral nerves 6-10 on each side, spreading; figs globose, glabrous, soft, as large as a cherry, with two bracts at base, connate, glabrous; mouth wide open, not projecting.

John Crow (Blake) Mts., 1700 ft., *Harris & Britton!* Fl. Jam. 10,765.

"Epiphytic on large tree-trunks, finally supported by its own roots." Leaves 7-10.5 cm. l., 3-4 cm. br.; petioles 1-2 cm. l.; stipules 5-8 cm. l. Figs yellow, nearly 2 cm. in diam., 2.5 cm. l. (soaked); peduncles about 1 cm. l.; basal bracts 2 mm. l.; mouth about 3-4 mm. in diam.

The specific name is in honour of Commander Hall, R.N., a resident in the locality.

8. **F. morantensis** *Britton* *Mss.*; leaf papery, glabrous, dotted with cystoliths on both sides, narrowly elliptical, subacuminate, base obtuse, lateral nerves about eleven on each side, spreading; fig depressed-globose, conspicuously broader than long, soft, larger than a cherry, with two bracts at base, not connate, minutely puberulous, mouth broad, neither projecting nor immersed.

Coastal thicket, Morant Point, *Britton* 4115!

Leaf 10.5 cm. l., 4 cm. br., nerves somewhat prominent on both sides; petiole 1.5 cm. l. Figs 2.5 cm. in diam., 1.7 cm. l.

9. **F. Grabhamii** *Britton* *Mss.*; stipules minutely puberulous or almost glabrous; leaves parchment-like, glabrous, dotted with cystoliths on both sides, elliptical-oblong to elliptical, subacuminate, base subacute to rounded, lateral nerves 7-9 on each side, spreading, almost straight; figs obovoid-globose, umbonate, glabrous, hard, as large as a cherry, with two bracts at base, not connate, minutely puberulous; mouth very deeply immersed in the umbo.

Park Mount, near Port Antonio, *Britton*, 2604! Silver Hill to Hardware Gap, *Harris & Britton!* Mabess River, *Harris!* Fl. Jam. 7704, 10,547.

We also include here, although we have not seen the figs at the time of writing—Clydesdale; Chester Vale; Sheldon Road; *Harris!* Fl. Jam. 5120, 5261, 5385.

*Tree* 35 ft. high. *Leaves* 6–12 cm. l., 3–6 cm. br.; nerves somewhat prominent on both sides; petioles 1·3–3 cm. l.; stipules 5–1 cm. l. *Figs* about 1·5 cm. in diam.; peduncles 7–12 mm. l.; basal bracts semicircular, 2 mm. l.; opening above mouth about 2 mm. in diam.; mouth 4 mm. below opening. Named in honour of Dr. Grabham of Kingston, Jamaica.

10. *F. Wilsonii* Warb. *tom. cit.* 467 (1903); twigs slender, (when dry) subrugose; stipules glabrous, leaves somewhat leathery, glabrous, oblong to obovate-elliptical, base generally subauriculate, cuneate, apex obtuse to subapiculate; figs pea-like, not depressed, glabrous, with two connate bracts at the base; mouth not or scarcely prominent, not surrounded by a ring.—*F. americana* Sw. *Prodr.* 127 (1788) & *Fl. Ind. Occ.* 1569 (non *Aubl.*). *F. pedunculata* Griseb. *op. cit.* 151 (1859) (non *Ait.*). *F. pallida* Griseb. *loc. cit.* (non *Vahl*).

*Swartz!* Radnor, Blue Mts., *Purdie!* *Wilson*; *Fairfield*, *Wullschlaegel*, 1377! *Moneague*, *Prior!* *March!* near *Hope River*, 1150 ft.; near *Bellevue*, 4250 ft.; *Bellevue*, 4000 ft.;  *Eggers!* below *Craig Hill*, near *Gordon Town*; *Claverty Cottage*, *Blue Mts.*; *J.P.* 1137, 1401, *Hart!* *Hanover*, *J.P.* 1295, *Morris!* *Content Road*, *Port Royal Mts.*; near *Troy*, 1400–1600 ft.; between *Lacovia* and *Elam Wharf*; *Iron Face*, *Chester Vale*, 3000 ft.; *Harris!* Fl. Jam. 5264, 8552, 9452, 9455, 9847, 10,030; *Grierfield*, near *Moneague* and *Mt. Diabolo*; *Britton*, 2638, 2719! *Belvedere*, *Hanover*, *Mrs. Britton*, 2858!

*Tree* 20–40 ft. *Twigs* 2–3 mm. br., grey, younger reddish, scaly. *Leaves* 4–10 cm. l., 1·5–3·5 cm. br.; nerves 6–10 on each side, slender, scarcely prominent, straight or slightly curved; stipules 1–2 cm. l., petioles 5–10 mm. l. *Figs* (when dry) red, 7–10 mm. br.; peduncles 4–6 mm. l., glabrous; bracts 1·5 mm. l., roundish, glabrous; mouth 1–1·5 mm. br.

11. *F. populnea* Willd. var. *brevifolia* Warb. *tom. cit.* 473; twigs (when dry) commonly furrowed, glabrous; stipules glabrous; leaves parchment-like, glabrous, on the upper surface minutely dotted with cystoliths, form and size variable, commonly ovate, more rarely elliptical, base roundish, truncate or obtuse, or more rarely subcordate, apex obtuse to shortly acuminate; figs globose or depressed-globose, or somewhat pear-shaped, long-stalked, with two small glabrous bracts scarcely connate; mouth a little prominent, not surrounded by a ring.—*F. laevigata* Vahl *Enum. ii.* 183 (1806); *Griseb. op. cit.* 151.

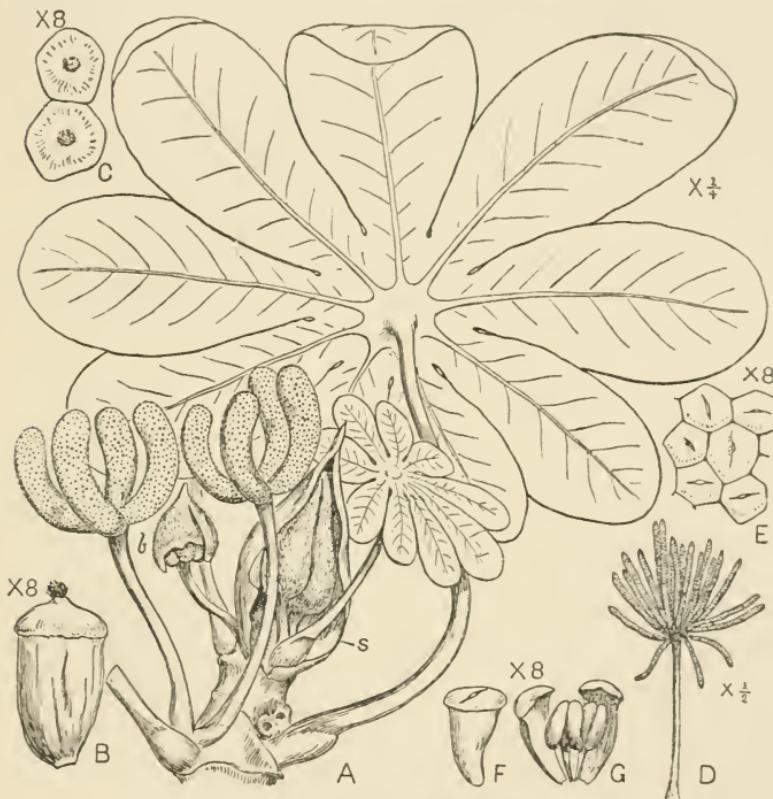
*Houstoun* in *Herb. Sloane* vii. 79a! *Great Goat Island*; *Fort Clarence Hill*; *Pedro Bluff*; near *Ferry*; *sea-coast*, *Bull Bay*; *Harris!* Fl. Jam. 9328, 9520, 9594, 9811, 10,172, 10,382.—*Florida*, *Cuba*, *Bahamas*, *Porto Rico*, *Lesser Antilles*.

*Trees* 20–35 ft. high. *Leaves* generally 5–10 cm. l., 3–5 cm. br.; nerves 6–9 on each side, slender; petioles glabrous, to 4 cm. l.; stipules 5–1 cm. l. *Figs* 8–12 mm. br., red; peduncles 1–2 cm. l.; bracts 2–3 mm. l., obtuse; mouth about 2 mm. br., closed by glabrous scales.

*F. pertusa* Griseb. *op. cit.* 152 (non *L. fil.*) has not been seen by us.

## 7. CECROPIA L.

Trees with milky juice; trunk and branches hollow with septa at intervals. Leaves long-stalked, ample, peltate, lobed, lobes prominently pinniveined; stipules large, connate, intrapetiolar, enclosing the terminal bud, deciduous. Flowers diœcious, very dense in cylindrical spikes. Spikes, several at the apex of

Fig. 16.—*Cecropia*.

A, Apex of female shoot; *s*, stipule enclosing terminal bud; *b*, spathe-like bract enclosing young female spikes.  
 B, Female flower.  
 C, Surface view of two female flowers.

D, Male inflorescence.  
 E, Surface view of male flowers.  
 F, An unopened male flower.  
 G, Opened male flower.

A, C. *cyrtostachya* Miq. (after Fl. Bras.). Other figures, C. *peltata* L.

a peduncle within a spathaceous caducous bract, female thick, male more slender, the flowers of both sexes very small and numerous, sessile. Male flowers: perianth tubular. Stamens 2, filaments straight, scarcely exserted. Ovary wanting. Female flowers: perianth tubular with a small opening at apex. Ovary included; style very short, stigma exserted, penicillate; ovule

erect, orthotropous. Fruit oblong, enclosed in the very thin perianth. Cotyledons equal, straight; radicle small, superior.

Species 30-40, natives of tropical America from the West Indies and Mexico to Brazil.

*C. peltata* L. *Syst. ed.* 10, 1286 (1759) & *Aman. v.* 410; *Wright Mem.* 302; *Miq. in Fl. Bras. iv. pt. 1,* 149; *Griseb. Fl. Br. W. Ind.* 153. *Yaruma de Oviedo, Sloane Cat.* 45, *Hist. i.* 137, *t.* 88, *f.* 2 & *t.* 89. *Coilotapalus &c. Browne Hist. Jam.* 111. (Fig. 16, B-G.)

Trumpet Tree, Snake Wood.

*Sloane Herb.* ii. 85, 86! *Broughton!* *Swartz!* *Wullschlaegel;* Moneague, *Prior!*—Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, St. Jan, Guadeloupe, Dominica, Martinique, St. Vincent, St. Lucia, Bequia, Barbados, Venezuela, Guiana.

Tree 16-40 ft. Leaves 3 dm. and more in diameter, with about 7-9 short lobes to  $\frac{1}{3}$  of the diameter, rough on upper surface, white-tomentose underneath, lobes elliptical, cuspidate. Male spikes numerous, shortly stalked, about 4 cm. l., 2 mm. br.; female 4-2, sessile, 5-6 cm. l., 6 mm. br. When forest is cleared at an elevation of about 200 ft. this tree springs up in great numbers.

## FAMILY IX. URTICACEÆ.

Herbs, shrubs or more rarely small trees. Leaves alternate (but opposite in *Pilea* and sometimes in *Bæhmeria*), stipulate. Flowers unisexual, monœcious or dicecious, clustered or scattered, clusters or flowers axillary, cymose, paniculate or crowded and sessile. Perianth simple, calycine, segments imbricate or valvate, or perianth sometimes in the female flower almost closed but with a small opening above, or perianth wanting (in *Phenax*). Segments of male perianth generally 4, of female 2, 3 or 4. Stamens as many as the lobes of the perianth and opposite to them; filaments in bud inflexed with reversed anthers, on flowering straight, exserted with erect anthers. Female flowers: ovary superior, one-celled, consisting of a single carpel. Style undivided, stigma penicillate-capitate or more or less elongated. Ovule affixed at or near the base, erect or ascending, orthotropous. Fruit an achene, sometimes enclosed in perianth. Seed erect, with or without endosperm.

Species nearly 500, natives of temperate and tropical regions.

Leaves opposite.

Inflorescence paniculate or capituliform. Stigma shortly penicillate. Herbs, sometimes shrubby..... 4. *Pilea*.

Flower-clusters sessile in axils or forming a spike. Stigma filiform persistent. Shrubs..... 5. *Bæhmeria*.

Leaves alternate.

Stigma penicillate-capitate. Shrubs or small trees.

Flowers sessile, thickly clustered on the rhachis, which becomes fleshy in fruit. Female perianth 2-lobed 1. *Gyrotænia*.

Flowers stalked. Female perianth 4-lobed, becoming somewhat fleshy and enlarged in fruit..... 2. *Urera*.

Stigma very short, becoming hooked in fruit. Annual herbs..... 3. *Fleurya*.

Stigma filiform.

Stigma persistent.

Flower-clusters sessile in axils or forming a spike, with small scarious bracts. Female flower with perianth. Shrubs or herbaceous..... 5. *Bæhmeria*.

Flower-clusters sessile in axils, with large ferruginous bracts. Female flower without perianth. Shrubby 6. *Phenax*.

Stigma not persistent. Female flowers geminate in the same axil, each with a broad bract. Perennial herb..... 7. *Rousselia*.

### 1. GYROTÆNIA Griseb.

Shrubs or small trees. Leaves alternate, entire, triplinerved; cystoliths fusiform, of various lengths, prominent, densely covering

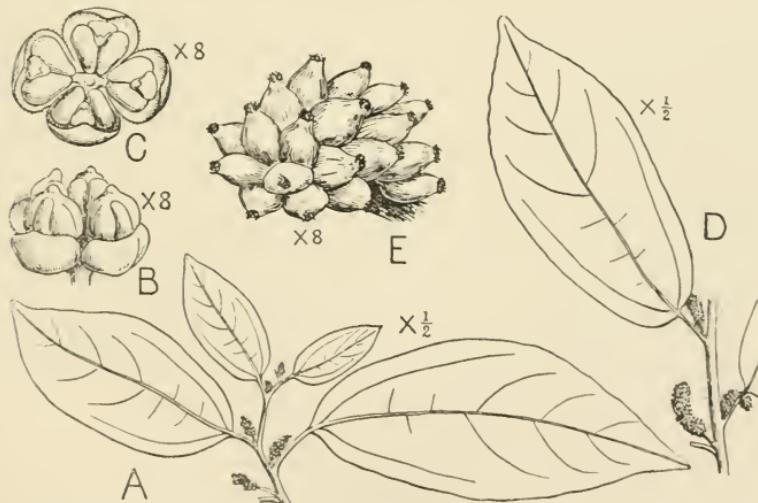


Fig. 17.—*Gyrotænia spicata* Wedd.

A, Shoot bearing male spikes.

B, C, Male flower.

D, Part of shoot showing female spikes.

E, Cluster of fruits.

the upper surface of older leaves; stipules small, lateral, free, caducous. Flowers diœcious, sessile, densely crowded in clusters more or less continuous, in axillary spikes or panicles. Male flowers: perianth 4-partite, segments imbricate. Stamens 4. Ovary rudimentary. Female flowers: perianth small, 2-lobed.

Stigma sessile, penicillate-capitate; ovule erect from the base. Achene obliquely ovate, with the perianth unchanged, but with the rhachis dilated-fleshy. Seed of similar form, with scanty endosperm; cotyledons broad.

Species 4, two natives of Jamaica, another of Cuba, and a fourth of Hispaniola.

Inflorescence spicate..... *G. spicata*.  
Inflorescence much branched..... *G. microcarpa*.

1. *G. spicata* Wedd. in *DC. Prodr. xvi. pt. 1*, 99 (1869).  
*Urera spicata* Wedd. *Monogr.* 155 (1856); *Griseb. Fl. Br. W. Ind.* 155; leaves subobliquely oblong-elliptical, shortly acuminate, entire or obsoletely sinuate, glabrous; inflorescence spicate; female rhachis fleshy, curved, not sinuate. (Fig. 17.)

*Swartz*; *Distin!* near Troy, 1800–2000 ft.; *Malvern*, 2200 ft.; *Dolphin Head*; *Harris!* Fl. Jam. 8823, 9076, 9657, 10,288.

Shrub 10–12 ft. high or tree 30 ft. high. Leaves 5–10 cm. l., 2·5–3·5 cm. br. Male spikes 1 cm. l., perianth 2 mm. in diameter. Female spikes 1–1·5 cm. l. Achene nearly 1 mm. l.

2. *G. microcarpa* comb. nov.; leaves elliptical to ovate, apiculate or acuminate, entire or obsoletely sinuate, somewhat puberulous along the midrib on upper surface and on nerves underneath or glabrate on both sides; inflorescence paniculate, much branched; female rhachis slightly fleshy.—*Wedd. Monogr.* 156 (1856); *Griseb. loc. cit.*; *Wedd. in DC. Prodr. xvi. pt. 1*, 95. *Urtica membranacea* *Wedd. Monogr.* 103 (nomen). *U. membranacea* *Sw. ex Wedd. loc. cit.* (nomen).

*Wright!* *Swartz!* *Macfadyen!* *Wilson!* *Moneague, Prior!* *Claverty Cottage*, Blue Mts., J.P. 966, *Morris!* *Dollwood*; near *Whitfield Hall Works*; *Spanish River*, Blue Mts.; *Old England*, Blue Mts.; near *Cascade River*; *Harris!* Fl. Jam. 5107, 5230, 5319, 6487, 6607; *Grierfield*, near *Moneague*, *Britton*, 2662!

Shrub or small tree to 20 ft. high, with stinging hairs. Leaves 5·5–10 cm. l., 3–4·5 cm. br.; principal veins 5–8 on each side; petiole slender 8–16 mm. l. Cymes 2–5 cm. l., laxly branched. Achene ovate or elliptical; ·75 to 1 mm. l.; perianth much shorter.

## 2. URERA Gaudich.

Shrubs or small trees, generally with stinging hairs. Leaves alternate, entire, sinuate or toothed, 3–5-nerved at base, pinniveined above; cystoliths in the form of dots or wanting; stipules free or more or less connate into one, intrapetiolar. Flowers dioecious in small clusters laxly paniculate. Panicles dichotomously cymose or irregularly branched, unisexual, axillary or at the older nodes. Male flowers: perianth 4–5-partite, segments ovate, slightly imbricate. Stamens 4–5. Ovary rudimentary. Female flowers: segments of the perianth 4, subequal or the exterior

smaller. Stigma generally subsessile, penicillate-capitate, persistent; ovule erect from the base. Achene straight or oblique, surrounded or enclosed by the fleshy enlarged perianth. Seed of similar form, with very little endosperm or none; cotyledons broad.

Species 19, natives of tropics in America and Africa, and of the Mascarene and Pacific Islands.

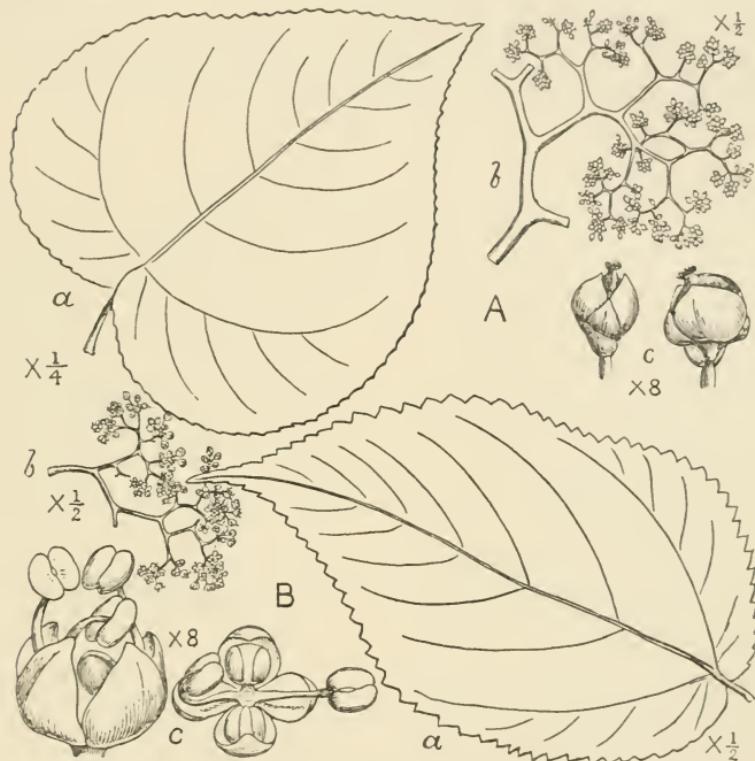


Fig. 18.—*Urera caracasana* Griseb.

A, From male plant.  
a, Leaf.

B, From female plant.  
b, Portion of inflorescence.

c, Flowers.

Leaves large, broadly ovate, more or less cordate, with large crenate teeth.

Cymes dichotomous; fruit 1·5 mm. l., vermillion..... 1. *U. caracasana*.  
 Cymes trichotomous; fruit 3 mm. l., white or rose..... 4. *U. baccifera*.  
 Leaves ovate-oblong or elliptical-oblong, crenate,  
 crenate-sinuate, or entire.  
 Tips of branches and leaves with stinging hairs..... 2. *U. elata*.  
 No stinging hairs; leaves glabrous..... 3. *U. expansa*.

1. ***U. caracasana* Griseb.** *Fl. Br. W. Ind.* 154 (1859); leaves broadly ovate, acuminate, cordate at the base with a broad and

open sinus, or rounded, crenate-dentate, above scabro-hispid, underneath more or less pubescent, nerves with a few stinging hairs; cymes regularly dichotomous; female flowers stalked, single or in threes; mature fruit vermilion-coloured.—*Wedd. in DC. Prodr. xvi. pt. 1, 89.* *Urera Jacquinii Wedd. in Ann. Sc. Nat. sér. 3, xviii. 200 (1852) (in part) & Monogr. 144, t. II. A. f. 3-6 (in part).* (Fig. 18.)

*Wright!*—Porto Rico, Guadeloupe, Martinique, St. Lucia, St. Vincent, Trinidad, continental tropical America.

Plant 10-20 ft. high, twigs generally with stinging hairs. Leaves variable in size, upper leaves 7-10 cm. l., lower much larger, 25-30 cm. l., 20-25 cm. br.; principal veins 6-12 on each side. Flowers diœcious or sometimes monœcious. Fruit 1.5 mm. l.

2. *U. elata* *Griseb. loc. cit.*; younger branches with numerous stinging hairs, thickened at the base, deciduous and leaving tubercles to 1 mm l.; leaves ovate or ovate-oblong, acuminate, rounded or emarginate at the base, in the upper two-thirds sinuate-crenulate or serrate or rarely subentire, 3-nerved at base, pinniveined above; young leaves with hispid stinging hairs on petioles and upper surface and with adpressed and inconspicuous hairs underneath, later glabrescent; cymes several times divaricate-dichotomous, female flowers separate, shortly pedicellate.—*Wedd. tom. cit. 91 (in part).* *Urera sinuata Wedd. in Ann. Sc. Nat. sér. 3, xviii. 201 (1852) & Monogr. 148.* *U. tuberculata Urb. Symb. Ant. i. 294 (1899).* *Urtica elata Sw. Prodr. 37 (1788) & Fl. Ind. Occ. 322.*

In fl. Aug.; *Swartz!* *Distin!* *Wilson!* *Moneague, Prior!* *March;* Content Road; Spanish River, Blue Mts.; *Harris!* Fl. Jam. 5280, 5814.

Tree 10-20 ft. Leaves 6-25 cm. l., 3-15 cm. br.; cymes 2-5 cm. l. Flowers diœcious. Fruit 3 mm. l.

3. *U. expansa* *Griseb. op. cit. 155*; with no stinging hairs; leaves elliptical or elliptical-oblong, apex somewhat acuminate, base subemarginate, more or less crenate, glabrous; cymes many times divaricate-dichotomous; female flowers pedicellate.—*Wedd. in DC. Prodr. xvi. pt. 1, 91.* *Urtica expansa Sw. Adnot. Bot. 60 (1829).*

*Wright!* *Swartz!* *Cuming!* *March!* *Morris!* near Colthirst River, St. George, *Harris!* Somerset Woods, near Mandeville; *Britton & Harris!* Fl. Jam. 5593, 10,612.

Plant 10-15 ft. Leaves 8-17 cm. l., 3-8.5 cm. br.; principal veins 5-6 on each side. Flowers diœcious. Achenes orange-yellow.

4. *U. baccifera* *Gaudich. in Freyc. Voy. Bot. 497 (1826)*; trunk and branches very often with prickles; leaves broadly ovate to roundish, acute or acuminate, base subcordate or rounded, irregularly sinuate-serrate, glabrous, or with scattered deciduous stinging hairs or prickles on upper surface, and with

or without recurved prickles underneath, especially on the nerves; cymes much branched, corymbiform; female flowers generally separated.—*Griseb. loc. cit.*; *Wedd. tom. cit.* 93. *Urtica frutescens* foliis amplioribus &c. *Browne Hist. Jam.* 337. *Urtica arborescens* baccifera *Plum. Pl. Amer. (Burm.) t. 260* & *Ic. pict. ined. v. 312*. *Urtica baccifera L. Sp. Pl. ed. 2, 1398 (1762)*; *Jacq. Hort. Schœnbr. t. 387*; *Descourt. Fl. vi. t. 433*.

*Wilson!* *March*; *Stony Hill*; *Fawcett!* *Fl. Jam.* 7177.—West Indies, S. America.

Plant 3-13 ft. high, with stinging hairs. Leaves 1-3 dm. l., 4.5-18 cm. br.; principal veins 6-8 on each side. Flowers diœcious. Fruit, perigone very succulent, white or rose-coloured, 5 cm. l.

### 3. FLEURYA Gaudich.

Annual herbs, often with stinging hairs. Leaves alternate, stalked, toothed, 3-nerved at base, pinniveined above; stipules connate in one, bifid, intrapetiolar. Flowers monœcious or diœcious in clusters on paniculate cymes; clusters unisexual or androgynous; panicles solitary, axillary. Bracts few. Male flowers: perianth 4-(5-)partite, subvalvate or slightly imbricate. Stamens 4(-5). Ovary rudimentary. Female flowers: perianth-segments 4, imbricate. Ovary at length oblique; stigma at length hooked; ovule erect from the base. Achene oblique, compressed, exserted. Seed of same form, with scarcely any endosperm; cotyledons broad.

Species 8, widely distributed through the tropics and extending into South Africa.

*F. æstuans* Gaudich. in *Freyc. Voy. Bot.* 497 (1826) & in *Voy. Bonite*, t. 83; *Griseb. Fl. Br. W. Ind.* 154; *Bak. in Refug. Bot.* t. 38; *Wedd. in DC. Prodr. xvi. pt. 1, 71*. *Urtica æstuans L. Sp. Pl. ed. 2, 1397 (1762)*. (Fig. 19.)

*Caley!* *Burlington*, *Harris!* *Fl. Jam.* 5981.—West Indies, tropical continental America, tropical Africa.

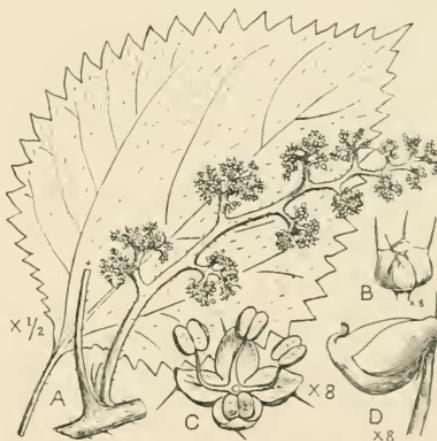


Fig. 19.—*Fleurya æstuans* Gaudich.

A, Leaf and inflorescence.  
B, Male flower bud.

C, Male flower. D, Fruit.

Stem to 12 dm. high; stem and leaves more or less furnished with bristly hairs. Leaves ovate or roundish-ovate, shortly acuminate, coarsely serrate, 8-13 cm. l. (-3 dm.). Panicles androgynous, the clusters androgynous and female on the same panicle, sometimes the male flowers on distinct peduncles. Female perianth very unequally 4-partite; stigma very short. Fruit deflexed, 1 mm. l. or slightly more.

#### 4. PILEA Lindl.

Herbs annual or perennial, more rarely shrubby at the base, sometimes creeping or diffuse. Leaves opposite, of each pair equal or very unequal, entire or toothed, 3-nerved or almost without nerves; stipules connate into one, intrapetiolar. Flowers monococious or diecious in axillary cymes. Cymes solitary in the axils, sometimes densely capituliform, sometimes laxly paniculate-branching, sessile or stalked. Bracts small. Male flower: perianth 4-partite, segments subvalvate, sometimes connate below. Ovary rudimentary. Female flower: perianth 3-partite, one segment (median) generally larger than the other two (lateral), but sometimes a segment is developed abnormally opposite to the median segment and similar to the lateral. Staminodes opposite to the segments, scale-like or more or less resembling the perianth-segments. Stigma sessile, penicillate. Achene ovate or roundish, lenticular compressed. Seed of similar form, with scarcely any endosperm; cotyledons broad.

More than 100 species, widely distributed throughout the tropics, but wanting in Australia.

Leaves entire.

Leaves very small, 1-nerved or without nerves.

Leaves obovate, crowded. Stem somewhat

succulent, becoming shrubby.....

1. *P. microphylla*.

Leaves roundish-deltoid or roundish-spathu-

late. Stems filiform, slender, creeping....

2. *P. herniaroides*.

Leaves 3-nerved.

Leaves linear-lanceolate.

Stems naked below. Cystoliths on upper  
surface, linear .....

3. *P. nudicaulis*.

Stems leafy below. Cystoliths on upper  
surface, punctiform.....

4. *P. lanceolata*.

Leaves oblanceolate, 3-5 cm. l.....

5. *P. flavicaulis*.

Leaves oblong-lanceolate, ovate-lanceolate or  
elliptical.

Cystoliths large and conspicuous on under  
surface.....

6. *P. Parietaria*.

Cystoliths inconspicuous beneath.

Segments of female perianth subequal.

7. *P. virgata*.

Leaves 3-6 cm. l., 1.2-2 cm. br.....

8. *P. alpestris*.

Leaves 1-2 cm. l., .5-.8 cm. br.....

Lateral segments scarcely half as long as

median.....

9. *P. Weddellii*.

Leaves elliptical-oblong to narrowly obovate,  
6-13 cm. l. (Leaves sometimes toothed  
near apex.) ..... 21. *P. reticulata*.

Leaves not entire.

Leaves of a pair unequal or differing in form.

Smaller leaf of a pair minute.

Larger leaves pinnatifid-lobed..... 10. *P. lucida*.

Larger leaves crenate-dentate..... 11. *P. crenulata*.

Smaller leaf one-half or one-third as long as  
the larger (sometimes even smaller on the  
same plant).

Branches hirsute.

Leaves glabrous..... 12. *P. Wilsonii*.

Leaves hirsute.

Cymes paniculate .....

Cymes umbellate or corymbose..... 14. *P. rufescens*.

Branches glabrous.

Larger leaves broader above the middle... 15. *P. saxicola*.

Larger leaves broader at the middle.

Leaves serrate in upper two-thirds..... 16. *P. Wullschlaegelii*.

Leaves serrate in upper third..... 17. *P. clandestina*.

Branches glabrous but ciliate at young nodes 18. *P. ciliata*.

Leaves of a pair of the same size or form, or,  
exceptionally unequal.

\*Stem and leaves glabrous.

†Peduncles (at any rate those of the fruiting  
cymes) generally longer than the petioles.

Leaves 1-nerved, penniveined..... 19. *P. serrulata*.

Leaves 3-nerved or triplinerved.

Leaves oblanceolate .....

Leaves ovate or elliptical.

Leaves lanceolate to narrowly-ellipti-  
cal..... 22. *P. crassifolia*.

Leaves ovate.

Leaves large, reaching 10 cm. or  
more in length.

Leaf-base rounded, sometimes  
slightly cordate or unequal;  
dorsal appendages of male  
flower linear.

Leaves elliptical or ovate-ellipti-  
cal, appendages of male  
flower erect or connivent... 23. *P. grandifolia*.

Leaves ovate (smaller than in  
*P. grandifolia*), appendages  
patent..... 24. *P. Elizabethæ*.

Leaf-base cordate, appendages of  
male flower broad and flat.... 25. *P. appendiculata*.

Leaves of medium size, not exceed-  
ing 5 cm. l.

Stipules elliptical, 5-6 mm. l.  
(Leaves sometimes with a few  
hairs.) .....

41. *P. caudata*.

Stipules semilunar, 5-1 mm. l.  
(Stem minutely puberulous.)... 26. *P. brevistipula*.

Leaves small, 1.5 cm. l. and less.... 27. *P. dauciodora* var.  
*parvifolia*.

†† Peduncles (at any rate those of the fruiting cymes) shorter than the petioles.

Leaves large, 5-13 cm. l. Stems not creeping.

Cymes paniculate, lax. (Leaves often entire)..... 21. *P. reticulata*.

Cymes densely clustered.

Leaves narrowly elliptical..... 28. *P. sessiliflora*.

Leaves ovate..... 29. *P. impressa*.

Leaves small, 1-2 cm. l. Stems creeping 30. *P. radicans*.

\*\* Stem or leaves puberulous, pubescent or pilose.

† Peduncles about equal to, or shorter than, the petioles; leaves small; stems creeping.

Leaves round, crenate..... 31. *P. nummularifolia*.

Leaves broadly obovate-spathulate, slightly crenate in upper half ..... 32. *P. depressa*.

Leaves narrowly elliptical, attenuated below, serrate..... 18. *P. ciliata*.

†† Peduncles (at any rate those of the fruiting cymes) longer than the petioles.

Stems creeping; leaves small, roundish to ovate.

Leaves with a few obscure teeth, glabrous beneath ..... 33. *P. rotundata*.

Leaves crenate-serrate, pubescent on nerves beneath.

Leaves elliptical-roundish ..... 34. *P. repens*.

Leaves ovate-roundish.

Male perianth pilose..... 35. *P. troyensis*.

Male perianth glabrous ..... 36. *P. Harrisii*.

Stems not creeping.

Leaves glabrous on both sides, larger 3-4 cm. l. Stem minutely puberulous ..... 26. *P. brevistipula*.

Leaves on upper surface glabrous, underneath pilose on nerves.

Cymes laxly paniculate, flowers few in clusters. Leaves large, 3-6 cm. l. 37. *P. obtusata*.

Cymes short with dense-flowered clusters at apex of peduncles.

Leaves small, 1.9-1.7 cm. l..... 40. *P. Hollickii*.

Leaves sparsely pilose on both sides, or glabrous above and minutely puberulous on nerves beneath, 1.5-3 cm. l. Stem procumbent ..... 38. *P. diffusa*.

Leaves sparsely pilose with pellucid hairs on upper surface, and pilose on nerves beneath, 1-3 cm. l..... 39. *P. lamiifolia*.

Leaves sparsely pilose with pellucid hairs or glabrate on both surfaces, 3-5 cm. l..... 41. *P. silvicola*.

Short tomentum (generally reddish) on apices of branches and on nerves on back of leaf; leaves 1.5-5.5 cm. l. 42. *P. nigrescens*.

1. *P. micropophylla* Liebm. in Vidensk. Selsk. Skr. sér. 5, ii. 296 (1851); diœcious or monœcious, herbaceous sometimes becoming

shrubby, glabrous; stems somewhat succulent, very branched, diffuse, leaves very small, those of a pair often unequal, elliptical or oblong or obovate or roundish, mostly obtuse, base often cuneate-attenuate, entire, one-nerved; cymules generally consisting of a single sessile cluster, shorter than the leaf, androgynous or unisexual.—*Griseb. Fl. Br. W. Ind.* 155 (including *var. trianthemoides*); *Wedd. in DC. Prodr. xvi. pt. 1.* 105 (in part); *Urb. Symb. Ant. iv.* 200. *P. trianthemoides*, *Lindl. Coll. Bot. sub. t. 4.* *Herniaria lucida aquatica Sloane Cat.* 50 & *Hist. i.* 145, *t. 93, f. 2.* *Urtica humilior disticha* &c. *Browne Hist. Jam.* 336. *Parietaria microphylla L. Syst. ed. 10,* 1308 (1759) & *Aman. v.* 412. *Urtica microphylla Sw. in Vet. Handl. Stockh. viii.* 66 (1787) & *Fl. Ind. Occ.* 305. *Urtica trianthemoides Sw. in Vet. Handl. Stockh. viii.* 68 (1787) & *Fl. Ind. Occ.* 307. (Pl. 1, B, f. 1.) Type in *Herb. Mus. Brit.*

*Sloane* *Herb. ii.* 121! *Houstoun!* *Wright!* *Liguanea, Broughton!* *Bancroft!* *Distin!* *Port Royal Mts., Purdie!* *Fairfield, Wullschaegel,* 1013! *Arnott!* *Prior!* *March!* *Jackson Town, Miss A. Moulton-Barrett!* *Bryans Hill;* *near Browns Town; Salem, Llandovery, St. Ann; Cinchona; New Forest; Harris!* *Fl. Jam.* 5394, 7257, 7407, 8165, 8418, 10,378.—*Florida, Bahamas, W. Indies, continental trop. America.*

*Stem* varying in length to 3 dm. and more. *Leaves* 1.5–7 mm. l., with linear transverse cystoliths on upper surface; petiole very short or 1–3 mm. l. *Flowers* greenish tinged with white and red. *Male flowers* with pedicel to .75 mm. l.; perianth about 1 mm. l., segments with short and broad glabrous dorsal appendage. *Female flowers* subsessile. *Achene* ovate, slightly rough, .5 mm. l.; median segment of perianth cucullate, scarcely longer than the lateral segments and a little shorter than the achene.

*Var. succulenta* *Griseb. loc. cit.* *Leaves* orbicular (3–5 mm. br.), base rounded or shortly cuneate, shortly stalked, stem shrubby, succulent.

*Wilson;* “*Jamaica,*” without locality or collector, in *Herb. Kew.*—*Porto Rico.*

2. *P. herniarioides* *Lindl. Coll. Bot. sub. t. 4* (1821); monoecious, herbaceous; stems short, crowded, filiform, very slender, not branching much, generally prostrate or creeping, glabrous; leaves minute, opposite (4 terminal, rosulate), roundish; upper surface and margin with a few longish hairs or glabrescent; cymules androgynous, generally sessile, in upper axils or among terminal leaves; female perianth rudimentary.—*Urb. Symb. Ant. iv.* 201. *P. deltoidea* *Liebm. in Vidensk. Selsk. Skr. Kopenh. sér. 5, ii.* 298 (1851); *Wedd. tom. cit.* 108. *P. microphylla* *Liebm. var. *herniarioides* Wedd. tom. cit.* 106 (1869). *P. Brittoniae* *Urb. Symb. Ant. v.* 528 (1908). *Urtica herniarioides Sw. in Vet. Handl. Stockh. viii.* 64, *t. II. f. 1* (1787) & *Fl. Ind. Occ.* 309. (Pl. 1, B, f. 2.) Type in *Herb. Stockh.*

In holes in limestone rock; *Morse's Gap, Harris;* *Fl. Jam.* 7396; between *St. Helen's Gap* and *Morse's Gap, Britton,* 95! *Key Is., Bahamas,*

Cuba, Hispaniola, Porto Rico, St. Cruz, Guadeloupe, Martinique, Costa Rica.

Stems 1-7 cm. l. Leaves 1-3 mm. l. and br. Male flowers, with pedicel to 2 mm. l., perianth 1.2-1.5 mm. l., dorsal appendage almost obsolete, in the form of a flat hairy tubercle. Female flower, perianth about 1 mm. l., with triangular subequal segments. Achene to 7 mm. l., ovate-elliptical, more or less muriculate, with somewhat transparent margin.

3. *P. nudicaulis* Wedd. in *Ann. Sci. Nat. sér. 3, xviii.* 208; dioecious, glabrous; stem jointed, naked below; leaves linear-lanceolate or narrowly lanceolate, rather acute, entire, 3-nerved, basal nerves near the margin, reaching nearly to the apex; cystoliths on upper surface linear; stipules very short, triangular; male cymes varying in length up to half as long as leaf; female cymes not much longer than the petioles.—*Griseb. op. cit.* 156; Wedd. in *DC. Prodr. xvi. pt. 1,* 111. *P. nudicaulis* Wedd.  $\beta$  *lanceolata* Griseb. *loc. cit.* *Urtica nudicaulis* Sw. in *Vet. Handl. Stockh. vi.* 36 (1785) & *Fl. Ind. Occ.* 311. (Pl. 1, B, f. 3.) Type in Herb. Mus. Brit.

Broughton! Masson! Swartz; Macfadyen! Arnttully; Cinchona; J.P. 1210, 1257, Hart! Content Road; Westphalia Road, 3000 ft.; Hope Grounds, 700 ft.; Harris! Fl. Jam. 5257, 7454, 8390.—Cuba.

Herb; stem erect or ascending, 3-9 dm. high, simple or with few branches. Branches slender, straight, erect, covered with oblong cystoliths. Leaves 4-8(-10) cm. l., 3-10(-14) mm. br.; cystoliths on upper surface very numerous, unequal, intricate; on lower surface conspicuous, larger, scattered, subequal, straight or curved; petiole 3-5 mm. l.; stipules to 6 mm. l. Male cymes to 4 cm. l., male flowers "white" (Swartz), stalked; perianth in bud 7 mm. l., dorsal appendage mucronate, about 1 mm. l. Female cymes 6-1 cm. l. Achene 6 mm. l., smooth, roundish-ovate slightly projecting beyond the median perianth-segment; median segment 75 mm. l., somewhat rhomboid, striolate-keeled; dorsal appendage level with apex, lateral segments elliptical, striolate, 3-4 mm. l.

4. *P. lanceolata* Wedd. in *Ann. Sc. Nat. sér. 4, i.* 208 (1854); monoecious, quite glabrous; stem leafy below; leaves narrowly lanceolate, acuminate, entire, 3-nerved, basal nerves very near the margin; stipules persistent, ovate-triangular, blunt, membranous; cystoliths on upper surface punctiform; cymes unisexual or androgynous, shorter than the leaves; achene ovate, very minutely granulate.—Wedd. in *DC. Prodr. xvi. pt. 1,* 110 (excl. syn. *P. nudicaulis* Griseb.). *Urtica lanceolata* Lam. *Encyc. iv.* 639 (1797). (Pl. 1, B, f. 4.)

Wright!—Hispaniola, Dominica, St. Vincent.

Stem 1-2 dm. high; rhizome creeping; stem erect, scarcely branching, slender. Leaves 3-5 cm. l., 3.5-8 mm. br., green on upper surface, grey beneath; cystoliths very numerous on both sides, underneath larger, linear, intricate; petiole scarcely 1 mm. l.; stipules 2 mm. l. Female cymes consisting of a few clusters, many-flowered and dense; peduncle longer than the petiole. Achene ovoid, 75 mm. l.; median segment as long as achene, about twice as long as lateral segments; dorsal appendage level with apex.

5. *P. flavicaulis* *Urb. & Britton Symb. Ant. vii.* 194, dioecious(?), glabrous, when dry white with cystoliths; leaves oblanceolate, 3-8 cm. l., apex acute or obtuse, base obtuse, sometimes subcordate, entire, 3-nerved or triplinerved, stalked; stipules lunar; cymes (male only seen) generally shorter than the leaf, long-stalked, paniculate. (Pl. 1, B, f. 5.)

In crevices of limestone rocks, Peckham woodland, Upper Clarendon, 2500-2800 ft., *Harris!* Fl. Jam. 10,881.

Suffrutescent; stem procumbent, and rooting at nodes below, sending up simple erect branches to 6 dm. high. Leaves 1-1.7 cm. br., nerves reaching to upper quarter of leaf, sometimes with two or three minute teeth near apex, cystoliths linear and fusiform, large and conspicuous on upper surface; petioles 3-8 mm. l. Stipules 1-2 mm. l. Male flowers crowded, small, sessile or subsessile, perianth of young flower about .5 mm. l., opposite pairs of segments unequal; dorsal appendage continuous with segment, broad, obtuse at apex, of larger segments .2 mm. l.

6. *P. Parietaria* *Blume Mus. Bot. Lugd. Bat. ii.* 48 (1856); a monoecious suffrutescent herb; stems ascending, simple, glabrous; leaves of same pair somewhat unequal in size, petioles more unequal, elliptical, acuminate, acute, base obtuse, sometimes acute, entire, 3-nerved, upper surface with scattered pellucid hairs, underneath glabrous or with hairs on midrib and nerves, margin ciliate; cystoliths on upper surface small, linear, inconspicuous, not prominent, on lower surface conspicuous, large, linear and fusiform; stipules very deciduous, short, triangular; cymes paniculate, clusters separate, androgynous, peduncle shorter than the petiole.—*P. ciliaris* *Griseb. op. cit.* 156 (as regards Jamaica) (non *Wedd.*). *P. ciliaris* *Fawc. Fl. Pl. Jam.* (non *Wedd.*). *Parietaria foliis ex adverso &c.* *Sloane Cat.* 50 & *Hist. i.* 144, t. 93. f. 1. *Urtica Parietaria* *L. Sp. Pl.* 985 (1753). (Pl. 1, B, f. 6.) Type in *Herb. Mus. Brit.*

On shady rocks, "Sixteen-mile walk," *Sloane Herb. ii.* 120! *Houston!* *Broughton!* *Macfadyen!* *McNab!* St. Thomas in the Vale, *Prior!* *Cinchona*, J.P. 1256, *Hart!* near Whitfield Hall Works, *Harris!* Fl. Jam. 5173.

Leaves 3-7 cm. l., 1.2-2.5 cm. br. Stipules about 1 mm. l. Cymes 1 or 2 in axils. Male bud .6-.7 mm. l., subglobose, flat-topped; dorsal appendages short, mucronate, patent. Achene .6-.7 mm. l., ovate-elliptical, smooth, projecting beyond the median segment by about one-third; median segment .5 mm. l., dorsal appendage somewhat tumid or keeled, ending above in a small mucro; lateral segments acuminate, more than half as long as the median.

There is in *Herb. Kew.* a specimen collected by Dr. Wright in Jamaica with long-stalked leaves nearly 1 dm. l. and 6 cm. br. which probably belongs here.

7. *P. virgata* *Wedd. in DC. Prodr. xvi. pt. 1.* 112 (1869); dioecious, glabrous, leaves 3-6 cm. l., oblong-lanceolate or narrowly elliptical, acutely acuminate, base emarginate, entire, triplinerved; cystoliths not conspicuous beneath; stipules very short,

truncate; cymes small, subsessile, shorter than the petiole; segments of female perianth subequal; achene roundish-ovate. (Pl. 1, B, f. 7.)

Union Hill, near Moneague, Prior! Union Hill, Britton, 2813!

Branches virgate (slender, straight, erect), covered with minute cystoliths. Leaves at each node subequal, 1·2-2 cm. br., with very small punctiform cystoliths on both sides; petioles at each node sometimes very unequal, 8-2·8 cm. l. Female flowers stalked, pedicels 1·2 mm. l. Achene roundish-ovate, 8 mm. l., median segment 8 mm. l., dorsal appendage tuberculate, lateral segments apiculate, a little shorter than the median segment.

8. *P. alpestris* sp. nov.; dioecious, shrubby, branches glabrous, except for the cilia between the petioles, or with very few short hairs; leaves of the same pair equal or unequal; limbs ovate-elliptical to narrowly elliptical, more or less acuminate, base obtuse, 1-2 cm. l., 5-8 cm. br.; cystoliths on upper surface minute, prominent, conspicuous, underneath minute, somewhat conspicuous; petioles 5-2 mm. l.; stipules triangular-acuminate, about 1 mm. l.; inflorescence 5-1 cm. l., male bearing 1-3 clusters, female more lax; segments of female perianth subequal; achenes 7 mm. l.—P. Parietaria var. *alpestris* Urb. *Symb. Ant.* i. 295 (1899). (Pl. 1, B, f. 8.)

Blue Mt. Peak, about 7200 ft., Harris! Fl. Jam. 5273, 5424; Hansen.

A low, much branched shrub, growing in patches and forming a dense undergrowth in the forest.

Male perianth 5 mm. l., stalked, pedicels to 7 mm. l.; segments separate to base, dorsal appendage continuous with segment and equal in length. Female flowers, median segment with small conical dorsal appendage, lateral long acuminate.

9. *P. Weddellii* Fawc. & Rendle in *Journ. Bot.* l. 177 (1912); monoecious, somewhat shrubby; stem ascending, simple or branched, glabrous; leaves of the same pair of unequal size, elliptical or narrowly elliptical, shortly or long acuminate, acute, base emarginate, entire, 3-nerved, glabrous on both sides or sparsely pilose on upper surface, pubescent on nerves beneath, margin glabrous or sparsely ciliate; cystoliths on both surfaces minute (above prominent and conspicuous, beneath inconspicuous); stipules deciduous, short, semilunar; cymes paniculate, androgynous; peduncle shorter than the petiole, sometimes a little longer; lateral segments of female perianth one-half to one-third as long as the median.—P. *ciliaris* var. *Rivoriae* Wedd. in *DC. Prodr. xvi. pt. 1*, 114 (1869) (in part). P. *Parietaria* *Griseb.* *op. cit.* 156 (as regards the Jamaican specimens). (Pl. 2, f. 2.)

Wright! Masson! Swartz! Bancroft! McNab! Bath, Purdie! Wilson! Blue Mts, Prior! J.P. 1147, Morris! Catherine's Peak, 4000 ft., Eggers! Portland Gap, 5500 ft.; near Morse's Gap, 4800 ft.; Harris! Fl. Jam. 5426, 7351.

Stem to 9 dm. high. Leaves 1·5-7·5 cm. l., 1-2·5 cm. br. Stipules 5-1 mm. l. Cymes 1 or 2 in axils, rose-coloured. Male bud 75 mm. l.,

globose-pyriform; segments with a raised median line ending in connivent tubercles. *Achene* .75 mm. l., roundish-elliptical or roundish-ovate, margined, muriculate, projecting beyond median segment of perianth by one-quarter to one-third; median segment as long as the achene, oblong-elliptical with a light-coloured dorsal keel; lateral segments elliptical, shortly acute.

10. *P. lucida* *Blume* *Mus. Bot. Lugd. Bat. ii.* 48 (1856); monœcious, shrubby, glabrous; leaves small, of two forms, cuneate, the larger leaf pinnatifid (1-3 lobes on each side), the other minute, obovate, entire, sometimes the larger also entire; cymes small, consisting of a single few-flowered cluster, androgynous or monœcious, with long stalks.—*Wedd. in DC. Prodr. xvi. pt. 1, 119*; *Griseb. op. cit. 156*, var.  $\alpha$  and var.  $\beta$  *cuneifolia* (in part). *Urtica lucida Sw. in Vet. Handl. Stockh. vi. 31 (1785)* & *Fl. Ind. Occ. 315*. (Pl. 1, B, f. 9.)

On damp rocks, or banks in shady woodland; *Swartz!* Union Hill, near Moneague, *Prior!* Tyre, near Troy, 2400 ft.; near Newmarket, 1200 ft.; *Harris!* Fl. Jam. 8807, 9082; Union Hill, near Moneague, *Britton & Hollick*, 2739, 2788!

A small shrub, stem 1-2 dm. high, diffusely branching, without leaves below; branches slender, leafy. Leaves 5-11 mm. l., 1.5-4 mm. br., shortly stalked, upper surface with large linear cystoliths. Peduncle nearly as long as the larger leaf.

*Male flowers* sessile or shortly pedicellate. *Perianth* "coloured" (Swartz), about 1.5 mm. l., globose, with triangular acute "green" dorsal appendages about .5 mm. l. *Female flowers* sessile or subsessile; perianth segments with small brown teeth, median segment about as long as the lateral segments. *Achene* elliptical, about 1.1 mm. l.

11. *P. crenulata* *Urb. Symb. Ant. v. 308 (1907)*; monœcious, somewhat shrubby, glabrous; leaves of the same pair of very unequal sizes, cuneate to narrowly obovate, the larger narrowly obovate or obovate-elliptical, apex rounded or obtuse, below long-attenuated into the short petiole, triplinerved, crenate-dentate near the apex, pinninerved, the other minute, entire; stipules semiorbicular or lunate, .3-.5 mm. l., persistent; cymes small, stalked, generally shorter than the larger leaf, somewhat capitulate.—*P. cuneifolia* *Wedd. in Ann. Sc. Nat. sér. 3, xviii. 212 (1852)* & *in DC. Prodr. xvi. pt. 1, 119*. *P. lucida* var. *cuneifolia* *Griseb. op. cit. 156 (1859)* (in part). *Urtica crenulata Sw. in Vet. Handl. Stockh. vi. 35 (1785)*. *Urtica cuneifolia Sw. op. cit. viii. 70 (1787)* & *Fl. Ind. Occ. 319*. (Pl. 3, f. 1.) Type in *Herb. Mus. Brit.*

Amongst moss on calcareous rocks; *Swartz!* northern slopes of Dolphin Head, *Harris!* Fl. Jam. 9238.

*Stem* erect or ascending from a creeping base, 4-7 cm. ("3 dm." Swartz) high, with simple branches. *Leaves* larger 1-2 cm. l., 4-8 mm. br.; stalk 2.5-1 mm. l.; smaller 1-4 mm. l., 1-2 mm. br.; cystoliths linear, much smaller and less conspicuous beneath. *Cymes* often consisting of a single cluster; peduncle 1-2 cm. l. *Male flowers* few in the lowest part of the inflorescence, perianth "red" (Swartz), .75 mm. l.,

with a short linear dorsal appendage. *Female flowers*, segments of perianth subequal. *Achene* ·7 mm. l., narrowly obovate, granulate.

12. *P. Wilsonii* Urb. *Symb. Ant.* v. 309 (1907); dioecious (?), annual herb, erect or suberect; stem and branches with spreading red hairs; stipules ovate or suborbicular, persistent; leaves of each pair unequal, sometimes very unequal, the larger spatulate, apex rounded, below long-attenuated into the short petiole, with about 7 crenatures above and entire below, the smaller sessile or subsessile, obovate, entire or with 3-5 crenatures above, one-nerved, pinniveined, glabrous; cymes pedunculate, small, somewhat capitulate.—*P. lucida* Bl. var. *cuneifolia* Griseb. *op. cit.* 156 (1859) (in part). (Pl. 3, f. 2.)

Elm Wood Estate (fide Urban), Wilson!

*Stems* 4-7 cm. high. *Stipules* ·8-1·2 mm. l. *Leaves* larger, ·6-1·4 cm. l., ·4-·7 cm. br., petiole 4-2 mm. l., smaller 2-5 mm. l., 2-4 mm. br.; cystoliths linear, underneath smaller and more numerous. *Peduncle* 6-7 mm. l. *Achene* elliptical, ·8 mm. l., smooth; median segment nearly as long as achene, lateral segment ·5 mm. l.

13. *P. rufa* Wedd. in *Ann. Sc. Nat. sér. 3, xxviii.* 220 (1852); monœcious; branches hirsute; leaves of the same pair of unequal size, the larger elliptical-ovate, sometimes narrowing upwards, stalked, the other much smaller, subsessile, roundish; triplinerved, serrate from above the middle or in upper two-thirds; hirsute, especially on the margins, and nerves beneath, hairs reddish; cymes androgynous, paniculate, peduncles much longer than the petiole.—Wedd. in *DC. Prodr. xvi. pt. 1*, 121; Griseb. *op. cit.* 157. *Urtica rufa* Sw. in *Vet. Handl. Stockh. viii.* 59 (1787) & *Fl. Ind. Occ.* 292. (Pl. 3, f. 3.)

In rocky places; Swartz! Macfadyen!

Shrubby; *stem* much branched, 2-3 dm. high. Larger *leaves* 1·5-4 cm. l., ·8-1·5 cm. br.; smaller *leaves* ·5-1·2 cm. l.; nerves reaching about the upper third of the leaf; cystoliths linear on upper surface, wanting or minute on lower surface; petioles ·5-1 cm. l. hirsute with reddish-brown hairs. *Stipules* roundish, 3-4 mm. l., glabrous, ferruginous (when dry), persistent. *Male flowers* with pedicel ·5-1 mm. l.; perianth ·8 mm. l., "white" (Swartz); dorsal appendage small, triangular, ·2 mm. l. *Female flowers* stalked. *Achene* about 1 mm. l., elliptical, broadly margined, minutely spotted, projecting beyond the median segment of perianth by one-third of its length; median segment slightly shorter than the achene, lateral segments about half as long as median.

14. *P. rufescens* Fawc. & Rendle in *Journ. Bot. l.* 178 (1912); monœcious; branches hirsute; leaves of the same pair of unequal size, the larger elliptical, stalked, the other much smaller, subsessile, roundish, triplinerved, serrate in the upper half, glabrous on upper surface, hirsute on margins and on nerves beneath, hairs reddish; cymes androgynous, umbellate or corymbose, peduncles much longer than the petiole. (Pl. 2, f. 3.)

On limestone rocks; near Troy, 2000 ft., *Harris!* Fl. Jam. 8533.

Shrubby; stem much branched, 2-3 dm. high. Larger leaves 1-2.2 cm. l., 6-1 cm. br.; smaller leaves 5-1 cm. l.; nerves reaching about the upper third of the leaf; cystoliths linear-fusiform, conspicuous on upper surface, smaller and much more numerous beneath; petioles 4-1 cm. l., hirsute with brownish hairs. *Stipules* roundish, 3-4 mm. l., glabrous, ferruginous (when dry), persistent. *Male flowers* white; perianth 7 mm. l.; dorsal appendage small, tuberculate. *Achene* 1.1 mm. l., elliptical, not margined, minutely spotted, projecting beyond the median segment by half its length; median segment 75 mm. l., lateral segments slightly shorter than the median.

15. *P. saxicola* *Urb.* *Symb. Ant.* v. 311 (1907); monœcious shrub; stems branching, glabrous; leaves of each pair equal or unequal, the larger stalked (the smaller subsessile), oblanceolate to obovate, base cuneate, apex obtuse, larger two or three times as large as the smaller, 3-nerved; cystoliths linear, large on upper surface, smaller and more numerous beneath, glabrous, crenate in the upper margin; stipules small, semiorbicular or semioval, persistent; cyme stalked, small, consisting of 1-3 few-flowered androgynous or female heads. (Pl. 3, f. 4.)

On rocks in woodland; near Troy, 1800-2200 ft., *Harris!* Fl. Jam. 8540, 8700.

Stems rooting at base, 2.5-3 dm. high. Leaves, larger 8-1.8 cm. l., 6-8 cm. br.; petiole 1-7 mm. l. *Stipules* 1-1.5 mm. l. *Peduncle* 5-1 cm. l. *Male flowers* (not seen by us), pedicel 1-1.5 mm. l.; perianth 4 mm. l., 3-partite almost to the base; stamens 3. *Female flowers*, pedicel 5-1 mm. l. *Achene* elliptical-ovate, 1 mm. l.; median segment about 6 mm. l., broad, oblong, apex truncate; lateral segments not much shorter, ovate-triangular.

16. *P. Wulffschlaegelii* *Urb.* *Symb. Ant.* v. 310 (1907); monœcious shrub; stems branching, glabrous; leaves of each pair equal or unequal, oval-elliptical, ovate or roundish, base and apex obtuse or rounded, 5-nerved, glabrous or sometimes sparingly pilose on the nerves beneath, serrate in the upper two-thirds; stipules ovate or broadly ovate, persistent; cymes long-stalked, small, bearing 1-3 few-flowered heads, unisexual or androgynous. — *P. diffusa* *Griseb.* *op. cit.* 159 (1859) (in part), (non *Wedd.*). (Pl. 3, f. 5.) Type at Munich.

On rocks; Fairfield, *Wulffschlaegel*, 1016! Somerset Woods, near Mandeville, *Harris & Britton!* Fl. Jam. 10,604, 10,611.

Stem rooting below. Leaves 7-3 cm. l., 7-2 cm. br.; nerves extending to two-thirds of limb; cystoliths linear, conspicuous on upper surface, smaller and more numerous beneath; petioles 3 mm.-2 cm. l. *Stipules* 3-4 mm. l. *Peduncle* 5-1.5 cm. l. *Male flowers*, pedicel 1.5-3 mm. l.; perianth about 1 mm. l., shortly campanulate, dorsal appendages short, broad. *Female flowers* subsessile, or pedicel 5 mm. l.; perianth, segments 3, the larger 8-1 mm. l., lateral 5-6 mm. l. *Achene* somewhat broadly ovate, red, brown-punctate, 1 mm. l.

17. *P. clandestina* *Wedd.* in *DC. Prodr. xvi. pt. 1*, 120 (1869); monœcious, glabrous; leaves of the same pair very

unequal, the larger oblong-lanceolate to elliptical, subsessile, in the upper half acutely serrate, triplinerved; cymes small, stalked, longer than the petiole, and sometimes than the subtending leaf. (Pl. 3, f. 6.) Type at Munich.

Mt. Carmel, *Wullschlaegel*, 1284! Woodstock, near Beaufort, Westmoreland, *Harris!* Fl. Jam. 9907.

A small shrub, 2-3 dm. high; stem leafless, branches leafy. Leaves, larger 1.5-2 cm. l., 5-8 mm. br., with (3-)5 teeth on each side, basal nerves extending beyond the middle; cystoliths linear, more numerous underneath. Cymes, female consisting of a single cluster, flowers with somewhat long stalks, 1 mm. l. and more. Achene ovate-elliptical, nearly 1 mm. l.; median segment of the perianth about .5 mm. l., with a blunt dorsal appendage, lateral segments .3 mm. l. Male flowers not seen.

18. *P. ciliata* Blume *Mus. Bot. Lugd. Bat. ii.* 46 (1856); monoecious, creeping; leaves elliptical, attenuated below, serrate except near base, 3-nerved, nerves prominent above, impressed below, with a few scattered pellucid hairs on the upper surface, pilose on the nerves below, margins ciliolate; stipules small, triangular, persistent; cymes small, generally unisexual, sessile; dorsal appendages of the male perianth triangular, acuminate.—*Urb. Symb. Ant. i.* 296. *P. Swartzii* Wedd. in *Ann. Sc. Nat. sér. 3, xviii.* 228 (1852) & in *DC. Prodr. xvi. pt. 1.* 160 (excl. Cuba); *Griseb. op. cit.* 158 (excl. Cuba). *Urtica ciliata* Sw. in *Vet. Handl. Stockh. vi.* 32 (1785), *Prodr. 36* & *Fl. Ind. Occ.* 298. (Pl. 3, f. 7.) Type in *Herb. Mus. Brit.*

In rocky woodland of the interior; *Swartz!* Springfield, *Wullschlaegel*, 1015!

Herb; stem prostrate with ascending branches, about 2 dm. high, nodes hirsute. Leaves 2-3.5 cm. l., 10-14 mm. br.; cystoliths small, linear above; petioles glabrate, 5-8 mm. l. Male flowers coloured, pedicellate, appendage as long as the segment and hirtellous, perianth (incl. appendages) 3.5 mm. l., anthers white. Female flowers green.

19. *P. serrulata* Wedd. in *Ann. Sc. Nat. sér. 3, xviii.* 213 (1852); monoecious, glabrous; leaves small, subsessile, oblong-lanceolate or obovate-lanceolate, obtuse, base cuneate-attenuate, serrulate or crenate in the upper half, one-nerved, penniveined; stipules semiorbicular or semiovate, persistent; inflorescence pedunculate, of small few-flowered androgynous heads, shorter than the leaves.—*Wedd. in DC. Prodr. xvi. pt. 1.* 140; *Urb. Symb. Ant. v.* 312. *P. lucida* var. *serrulata* *Griseb. op. cit.* 156 (1859). *Urtica serrulata* Sw. in *Vet. Handl. Stockh. viii.* 65 (1787) & *Fl. Ind. Occ.* 313. (Pl. 3, f. 8.)

On calcareous rocks in the interior; *Swartz!*—There is a variety in Cuba.

A small shrub; stem erect, branching, 2-3 dm. high; branches stiff and erect, leafless below, internodes short. Leaves 1-2 cm. l., 3-4 mm. br.; cystoliths linear, conspicuous on upper surface. Peduncle red. Male flowers 1 or a few, subsessile, amongst the more numerous female flowers; perianth red, 1.3 mm. l., globose; dorsal appendage .4 mm. l.,

linear blunt. *Female flowers* 5 mm. l., with perianth-segments subequal, median hooded with upper edge fimbriate, lateral oblong, acute; pedicels of same length.

20. **P. oblanceolata** *Fawc. & Rendle in Journ. Bot. I.* 179 (1912); dioecious (?) (only the female flower seen), glabrous, herbaceous, stems decumbent or ascending, simple; stipules 1-1.5 mm. l., lunate; leaves of the same pair more or less unequal, oblanceolate, acute or shortly acuminate, base long-attenuate, 6-3 cm. l., serrate at the apex, triplinerved, membranous; cystoliths on the upper surface linear, beneath very inconspicuous, very minute; cymes female, paniculate, clusters many-flowered, dense-flowered; peduncles much longer than the petioles. (Pl. 2, f. 1, 4.) Type in Herb. N. York Bot. Gard.

In crevices of rocks; Peckham Woods, Upper Clarendon, 2500 ft.; *Harris!* Fl. Jam. 10,946.

Stems 10-30 cm. l., rooting below at the nodes and between the nodes, when dry, more or less compressed, 1.5-3 mm. br., with very short linear cystoliths only seen on young shoots; internodes very variable in length 1-4 cm. l. Leaves 1.8-1 cm. br., with the two lateral nerves produced to about three-fourths of their length, petioles 3-1 cm. l. Cymes solitary from axils of upper leaves, peduncles 3-4 cm. l. *Female flowers* sessile or subsessile. Achene 1 mm. l., broadly ovate, muriculate; median segment of perianth 1.2 mm. l., dorsal appendage tuberculate, lateral segment two-thirds as long.

21. **P. reticulata** *Wedd. in Ann. Sc. Nat. sér. 3, xviii.* 215 (1852); monœcious or dioecious, glabrous; leaves subobliquely elliptical-oblong to narrowly obovate, acute to acuminate, generally serrate above the middle, or rarely entire, tripli-(3-) nerved, nerves reaching nearly to the apex; stipules triangular-ovate, persistent; cymes unisexual or androgynous, peduncles shorter or much longer than the petioles.—*Wedd. in DC. Prodr. xvi. pt. 1,* 145; *Griseb. op. cit.* 156. *Urtica reticulata* *Sw. in Vet. Handl. Stockh. vi.* 30 (1785) & *Fl. Ind. Occ.* 286. (Pl. 3, f. 9.)

On rocks, in forest; *Swartz!* Westmoreland, *Purdie!* slopes of Dolphin Head, 1200-1400 ft. *Harris!* Fl. Jam. 9245, 9270.

Stems herbaceous or somewhat shrubby, 2 dm. to 1 m. high, simple, leafy only at the top. Leaves 6-13 cm. l., 2-4.5 cm. br.; cystoliths linear, unequal on both sides; petioles 1-4 cm. l. *Male flowers*, pedicels to 1 mm. l.; perianth .9 mm. l.; crimson, dorsal appendage small, tuberculate. *Female flowers* "white" (*Swartz*), sessile or subsessile. Achene 1.1 mm. l., roundish-ovoid, muriculate; median perianth-lobe nearly the length of achene, tuberculate near the apex.

22. **P. crassifolia** *Blume Mus. Bot. Lugd. Bat. ii.* 52 (1856); monœcious or dioecious, glabrous; leaves ovate to elliptical-lanceolate, acuminate, base rounded and emarginate, sometimes subpeltate, serrate from near the base, triplinerved; stipules rather large, oblong-lanceolate, deciduous; cymes paniculate; flowers dense in small roundish separate clusters, peduncles much longer than the petioles.—*Wedd. in DC. Prodr. xvi. pt. 1,* 143.

*P. densiflora* Kunth *Ind. Sem. Hort. Berol.* 12 (1846); *Griseb. op. cit.* 157; *Wedd. Monogr.* 219, *t. 6 c, fig. 16, 17.* *Urtica crassifolia* Willd. *Sp. Pl. iv.* 349 (1805). (Pl. 3, f. 10.)

Wright! Broughton! Dancer! Macfadyen! Wilson; YS.; Fairfield; Wullschaegel, 1018, 1019! Moneague, Prior! March; Holly Mount, Mt. Diabolo, 2500 ft., Harris! Fl. Jam. 6490, 8496, 8963; Belvedere, St. Thomas, Britton, 3667!

Stems 9-12 dm. high, ascending, woody at base. Leaves 3-10 cm. l., 1.5-4 cm. br.; nerves produced nearly to the apex; cystoliths unequal fusiform, larger on the upper surface; petiole 5-4 cm. l. *Stipules* 5-10 mm. l. *Cymes* solitary, exceeding the leaves; peduncles 2-4 cm. l. *Male flowers* with pedicels to 7 mm. l.; perianth about 1 mm. l., globose, coherent below; dorsal appendages 1 mm. l., flat-triangular. *Female flowers* red, sessile or subsessile. *Achene* 8 mm. l., roundish-ovate, very oblique, punctate; median segment 6-8 mm. l., about twice as long as the acuminate lateral segments, dorsal appendage apiculate; a fourth segment similar to the lateral segments sometimes present, opposite the median.

23. *P. grandifolia* Blume *Mus. Bot. Lugd. Bat. ii.* 52 (1856); dioecious, glabrous; leaves broadly ovate, sometimes elliptical, acuminate, base obtuse or rounded, crenate-serrate with large teeth, triplinerved, with scattered dark sunken glands on under surface, occasionally puberulous on veins beneath; stipules large, elliptical, persistent; cymes laxly many-flowered, peduncles generally longer than the petioles, dichotomously paniculate.—*P. grandis* Wedd. in *Ann. Sc. Nat. sér. 3, xviii.* 216 (1852) & in *DC. Prodr. xvi. pt. 1,* 142 (excl. habitat St. Thomas); *Griseb. op. cit.* 157. *Urtica iners* racemosa &c. *Sloane Cat.* 38 & *Hist. Jam. i.* 124, *t. 83, f. 2.* *Urtica erecta*, *foliis* &c. *Browne Hist. Jam.* 337. *Urtica grandifolia* L. *Amæn. v.* 409 (1760) & *Sp. Pl. ed. 2,* 1396; *Sw. Obs.* 357. (Pl. 3, f. 11.) Type in Herb. Mus. Brit.

#### Dwarf Cedar.

Hope River, and in mountains in Guanaboa, *Sloane Herb. ii.* 76! Shakspear! Swartz! Caley! Macfadyen! Westmoreland, Purdie! Moneague; Tiddenham, St. Ann, Prior! March! Newcastle, 3500 ft., Eggers! near Cinchona, C. Nicholls! Old England, Blue Mts., Harris! Scotts Hall, St. Mary, 600 ft. Thompson! Fl. Jam. 5295, 5296, 6748, 7397.

Shrubby. Stems 9-18 dm. high. Leaves generally 1-2 dm. l., 5-1 dm. br.; nerves produced nearly to the apex; cystoliths on upper surface very unequal, fusiform or punctiform, underneath subequal, linear, smaller and more frequent; petiole generally longer than the next internode. *Stipules* 1.5-2 cm. l. *Cyme* (including peduncle) shorter than the leaves, about equaling its own peduncle, 6-12 cm. l.; flowers purplish, red, white or green. *Male flowers*, with pedicel to 7 mm. l.; perianth globose, 1.5 mm. l., with erect or connivent, linear, thick dorsal appendages 3-4 mm. l. *Female flowers* red, stalked; pedicel 3 mm. l. *Achene* 5 mm. l., elliptical; median segment about 5 mm. l., dorsal appendage blunt, projecting above apex; lateral segments about 3 mm. l.

24. *P. Elizabethæ* Faure & Rendle in *Journ. Bot. l.* 179 (1912); dioecious (male plant only seen), glabrous, stems woody; leaves

ovate, acuminate, base obtuse or rounded, crenate-serrate; stipules elliptical, deciduous; cymes paniculate densely many-flowered; dorsal appendages of the male perianth patent. (Pl. 2, f. 5.)

Hills near Bulstrode, Westmoreland; in fl. March; Mrs. Elizabeth G. Britton, 2876!

Leaves 1 dm. or less, 3-6 cm. br., nerves produced nearly to the apex, with numerous dark sunken glands on the lower face following the course of the veins, margin less coarsely serrate than in *P. grandifolia*; cystoliths on upper surface very unequal, fusiform or punctiform, beneath subequal, linear, smaller and more frequent. *Stipules* 1 cm. l. *Cymes* (including the peduncle) shorter than the leaves, 2.5-6 cm. l. *Male perianth* globose, 1.2 mm. l., with patent thick appendages, .2 mm. l.

25. *P. appendiculata* Fawc. & Rendle in *Journ. Bot.* l. 179 (1912); monoecious, leaves stalked, ovate, acuminate, more or less cordate, margin crenate-serrate with large teeth, 3-nerved, glabrous on upper surface, more or less pilose beneath, especially on the nerves; stipules rather large, bluntly and broadly ovate, deciduous; cymes, male forming several dense clusters at end of a long peduncle; female much shorter, in the same leaf-axil as male; male flower, dorsal appendages broad and flat. (Pl. 2, f. 6).

In shady places near river; in fl. Feb.; Leicesterfield, Upper Clarendon, 1800 ft.; Harris! Fl. Jam. 10,843.

Stem to 3 ft. high. Leaves 7-12 cm. l., 5-7 cm. br., nerves produced nearly to apex; cystoliths on upper surface numerous, linear, smaller beneath; petiole 2-5 cm. l. *Stipules* 1 cm. l. *Cymes*, male, peduncle to 7 cm. l.; flower-heads white, each 6-8 mm. in diam.; perianth (with appendages) about 2 mm. l., with pedicel of equal length, ellipsoidal-globose, segments coherent below, dorsal appendages roundish-elliptical about half the length of the perianth. *Female cymes*, peduncle to 1 cm. l., glabrous; flowers .5 mm. l., sessile and subsessile, perianth-segments subequal and coherent in the greater part of their length.

26. *P. brevistipula* Urb. *Symb. Ant.* vi. 6 (1909); herb, monoecious; stems at apex minutely puberulous; leaves of each pair unequal, stalked, the larger shortly ovate to elliptical, base rounded or obtuse, apex generally obtuse, crenate in the upper half, 3-nerved or triplinerved, glabrous; stipules short, semilunar; cymes long-stalked, subpaniculate, androgynous, clusters dense-flowered. (Pl. 3, f. 12.)

In crevices of rocks; between Black River and New Market, 150 ft.; Harris! Fl. Jam. 9905.

Stems ascending, rooting below, 10-15 cm. l., simple or slightly branched. *Stipules* .5-1 mm. l. *Leaves*, the larger 3-4 cm. l., 1.5-3 cm. br. petiole 3-15 mm. l., the two lateral nerves produced to the upper third; cystoliths linear, conspicuous on upper surface. *Inflorescence* solitary in the axils of the upper leaves. *Male flowers* subsessile; perianth globulose-pyriform light-coloured, cohering to middle, 1 mm. l.; dorsal appendages short, bluntly triangular, of one pair broader than the other. *Female flowers* sessile or subsessile, twice as long as the lateral. *Achene* elliptical, .6 mm. l., pale yellow; median segment .6 mm. l., dorsal appendage tuberculate.

27. *P. dauciodora* var. *parvifolia* Wedd. in DC. *Prodr. xvi.* pt. 1, 139 (1869); monoecious, glabrous, stems slender, rooting; leaves small, roundish-ovate, base rounded, 3-nerved, serrate in the upper half; stipules very small, triangular, persistent; cymes androgynous, small, consisting of a few clusters, long-stalked, exceeding the leaf.—Urb. *Symb. Ant.* v. 311, under *obs. ii.* (Pl. 3, f. 13.) Type at Munich.

Springfield, Wullschlaegel, 1014!

Leaves 5-13 mm. l., 3-11 mm. br.; nerves extending to the upper third of the limb; cystoliths fusiform-linear; petiole as long as or shorter than the limb. Male perianth globose-pyriform 1 mm. l.; dorsal appendage mucronate. Achene ovate 7 mm. l., median segment barely 6 mm. l., double the length of lateral. (Material very scanty.)

28. *P. sessiliflora* Wedd. *Monogr.* 242 (1856); glabrous; leaves elliptical or narrowly elliptical, in each pair equal or often very unequal, narrowed at apex and base, acute, serrulate on the upper half or third, triplinerved, basal nerves not reaching apex; stipules short, triangular; cymes small, shortly stalked, much shorter than the petiole; peduncle winged.—Griseb. *op. cit.* 157; Wedd. in DC. *Prodr. xvi.* pt. 1, 147. *Urtica sessiliflora* Sw. in *Vet. Handl. Stockh.* vi. 33 (1785) & *Fl. Ind. Occ.* 321. (Pl. 3, f. 14.)

Swartz! Manchester, Purdie! Springfield, Wullschlaegel, 1020! Wilson! Battersea Woods, near Christiana, 3000 ft., Harris! *Fl. Jam.* 8266.—Colombia.

Stem erect or creeping below, simple or branched at base, 2-3 dm. high, the lower part leafless, with small round brownish scales on surface. Leaves 3-8 cm. l., 5-5 cm. br., smaller leaves, some as short as 1 cm.; cystoliths very small, fusiform and punctiform on upper surface; petiole of larger leaf variable in length, 1.5-3 cm. l. Stipules 1.5 mm. l. Female flowers pedicellate or sessile. Achene 1.5 mm. l., obliquely ovate, a little longer than the perianth, lateral segments ovate, about half as long as median segment, which has a short, pointed dorsal appendage. Male flowers not seen.

29. *P. impressa* Urb. *Symb. Ant.* v. 314 (1907); dioecious, herbaceous, rooting below; stem simple or slightly branched, glabrous; stipules semilunar to shortly triangular, persistent; leaves of each pair equal or unequal, the larger ovate or ovate-elliptical, base rounded subemarginate, subacuminate, 3-nerved, or triplinerved, nerves extending two-thirds length of limb, glabrous, dentate in the upper  $\frac{1}{3}$ - $\frac{2}{3}$ ; cymes (male only seen) capitate, much shorter than the leaves. (Pl. 3, f. 15.)

In damp forest N.W. slope of Dolphin Head, 1400 ft., Harris! *Fl. Jam.* 9271.

Stems 2-3 dm. high, stout, with small, round, brownish scales on surface. Stipules 1-1.5 mm. l. Leaves glandular-dotted beneath, the larger 5-8 cm. l., 2.5-4 cm. br., with petioles 1.5-3 cm. l., the smaller with shorter petioles; cystoliths on both sides punctiform and somewhat prominent. Cymes densely many-flowered, 1-1.5 cm. in diam.; peduncle

·3-2 cm. l. *Male flowers*, pedicel to 3 mm. l.; perianth 3-3·5 mm. l., dorsal appendage linear, ·7-1 mm. l., dotted with brown cystoliths. In one specimen there are sometimes three leaves at a node.

Var. *troyana* *Urb. loc. cit.*; leaves at the base subpeltate, somewhat more acuminate, triplinerved; petioles glabrous. (Pl. 3, f. 16.)

In crevices of rocks; near Troy, 2000 ft., *Harris!* Fl. Jam. 8532.

*Male flower*, perianth subglobose, nearly 3 mm. l.; appendages triangular, obtuse, conspicuously marked with linear cystoliths, about 2 mm. l.

30. *P. radicans* *Wedd. in Ann. Sc. Nat. sér. 3, xviii.* 223 (1852); monœcious (Swartz), growing and rooting along branches of trees and rocks, glabrous; leaves ovate or rhomboid-elliptical, sometimes those of a pair unequal, obtuse, base cuneate, with 3-4 large crenatures in the upper half, triplinerved, nerves about two-thirds of length of limb; stipules minute; rarely flowering; cymes small, androgynous (Swartz), subsessile.—*Griseb. op. cit.* 158; *Wedd. in DC. Prodr. xvi. pt. 1,* 148. *Urtica radicans* *Sw. in Vet. Handl. Stockh. vi.* 29 (1785) & *Fl. Ind. Occ.* 299. (Pl. 3, f. 17.)

*Swartz!* *Macfadyen!* *Wilson!* J.P. 980, *Morris!* near Mabess River; Tyre, near Troy, 2200 ft.; *Harris!* between Mansfield and Devils River, *Harris & Britton!* Fl. Jam. 7466, 7706a, 9081, 10,574.

*Herb*; stems long (4-5 dm.), slender, branching, flexuose. Leaves 1-2 cm. l., 5-12 mm. br. (sometimes smaller); cystoliths linear and fusiform. *Flowers* "green" (Swartz). *Male perianth* 2 mm. l.; dorsal appendages conical, ·75 mm. l. *Female flowers* not seen.

31. *P. nummularifolia* *Wedd. in Ann. Sc. Nat. sér. 3, xliii.* 225 (1851); monœcious, creeping; leaves small, round, crenate except at the base, hairy on both sides, 3-nerved; stipules rounded; cymes small, dense, unisexual or androgynous; male terminal about half as long as leaves, female axillary or terminal, pedunculate, not or scarcely equaling the petiole.—*Griseb. op. cit.* 158; *Wedd. in DC. Prodr. xvi. pt. 1,* 158; *Urb. Symb. Ant. ir.* 204. *Nummularia saxatilis* &c. *Sloane Cat.* 90 & *Hist. i.* 208, *t.* 131, *f.* 4. *Urtica nummularifolia* *Sw. in Vet. Handl. Stockh. viii.* 63, *t.* 1, *f.* 2 (1787) & *Fl. Ind. Occ.* 301. (Pl. 3, f. 18.)

On rocks by Hope River, Liguanea, *Sloane Herb.* iv. 21! *Swartz!* *Shakspear!* Hope Gardens (cult. on tree-fern stems), Fl. Jam. 8360.—Cuba, Porto Rico, Vieques, St. Thomas, St. Cruz.

*Herb*; stems of indefinite length, villose. Leaves 6-15 mm. l. and about as br.; cystoliths very minute on both sides; petiole 3-10 mm. l., pubescent-pilose. *Stipules* 1-2·5 mm. l., scarious. *Male flowers* with hirsute pedicels 3-5 mm. l.; perianth ovoid-globose, to 2·5 mm. l., with broadly triangular hirsute dorsal appendages (·75 mm. l.). *Female flowers* subsessile or pedicellate. *Achene* ·75 mm. l., obliquely roundish-ovate, projecting more than double beyond the median perianth-segment (·3-·4 mm. l.), lateral segment less than half as long as median.

32. **P. depressa** Blume *Mus. Bot. Lugd. Bat. ii.* 46 (1856); dioecious (monoecious ?), creeping; leaves small, broadly obovate-spathulate, sometimes roundish, very obtuse, slightly crenate in the upper half, glabrous on both sides or puberulous or sparsely pilose, margin ciliolate, 3-nerved; stipules roundish; cymes small, male subsessile, female pedunculate, peduncle shorter or longer than the petiole.—*Griseb. op. cit.* 158; *Wedd. in DC. Prodr. xvi. pt. 1.*, 159. *Urtica depressa* Sw. in *Vet. Handl. Stockh. viii.* 64 (1787) & *Fl. Ind. Occ.* 303. (Pl. 3, f. 19.)

In damp shady places, amongst grass by the side of cultivated ground; Liguanea, *Broughton*! *Swartz*! Yallahs Valley, *Harris*! Windsor Lodge, Blue Mts., 1400 ft., *Jekyll*! *Fl. Jam.* 7706, 8433.

Stems of indefinite length, to 2·5 dm., puberulous; internodes more or less elongated. Leaves glaucous underneath, 5-12 mm. l., 4-9 mm. br.; nerves generally not much more than half as long as limb; cystoliths fusiform and linear, crowded on lower surface, only along margin on upper surface; petiole 2-5 mm. l., puberulous. Stipules to 2 mm. l. Cymes consisting of a single cluster. Male flowers pedicellate; perianth (incl. appendages) 2·5 mm. l., puberulous, segments with a triangular dorsal appendage with enlarged base as long as the segment (1·5 mm. l.). Female flowers pedicellate. Achene obliquely roundish, scarcely 5 mm. l., projecting by about half beyond larger perianth-segment. There is a small-leaved variety in Cuba (var. *microphylla* Griseb. Cat. 60, *Wright*, 1678, 1682, 2237).

33. **P. rotundata** Griseb. *Fl. Br. W. Ind.* 158 (1869); monoecious, creeping; leaves small, roundish or obovate, with a few small crenatures in the upper half, glabrous on both sides or with a few pellucid hairs on the upper surface, 3-nerved; stipules rounded; cymes unisexual, consisting of a single cluster, peduncles longer than the petiole.—*Wedd. in DC. Prodr. xvi. pt. 1.*, 156. (Pl. 3, f. 20.)

In crevices of rocks amongst decaying leaves in woodland; *Wilson*! *Wullschlaegel*; Marshall's Pen, near Mandeville, *Harris & Britton*! *Fl. Jam.* 10,603.

“Habit of a small *Peperomia*” (Grisebach). Stem 3-10 cm. l., at length ascending, glabrous, lower nodes leafless and rooting. Leaves 1-2 cm. l. and nearly as broad; cystoliths fusiform and linear. Cymes from the upper axils, 5 mm. br.; male peduncle much longer than the leaf, female a little longer than the petiole. Male flowers stalked, pedicel 1 mm. l.; perianth more than 2 mm. l., brown-spotted near base, and on dorsal appendages and below them; appendages about 5 mm. l., linear. Achene stalked, nearly 2 mm. l., roundish-ovate, muriculate, with a narrow margin, median perianth-segment as long as the achene, dorsal appendage large and conspicuous, nearly level with the apex, lateral segments about 1·2 mm. l.

34. **P. repens** Wedd. in *Ann. Sc. Nat. sér. 3, xviii.* 220 (1851); monoecious, creeping; leaves elliptical-round or obovate, obtuse, base broadly cuneate or rounded, crenate or crenate-serrate in the upper half, glabrous on the upper surface, pubescent on the nerves beneath, 3-nerved; stipules broadly ovate, persistent; cymes small, dense-flowered, androgynous, peduncle filiform,

generally longer than the petiole.—*Griseb. op. cit.* 158; *Wedd. in DC. Prodr. xvi. pt. 1, 155*; *Urb. Symb. Ant. iv. 204*. *Urtica repens Sw. in Vet. Handl. Stockh. viii. 61, t. 1, f. 1* (1787) & *Fl. Ind. Occ. 294*. (Pl. 3, f. 21.)

*Bancroft! Wullschlaegel; Moneague, Prior! Bath, G. Nichols!*—Cuba, Hispaniola, Porto Rico, Peru.

*Herb*; stems elongate, pubescent, rooting at nodes, simple or branching sparingly, branches at length ascending. Leaves 1-3 cm. l., 1-2.5 cm. br.; petiole pubescent. *Stipules* 1-2 mm. l. *Cymes* scarcely as large as a small pea. *Male flowers* near the base of the cymes, solitary or very few, subsessile or with pedicel 1 mm. l. *Perianth* in bud globose, glabrous, 1 mm. l.; segments elliptical projecting above the apex of bud with a ventral appendage covering apex; anthers roundish. *Female flowers* subsessile or shortly pedicellate, .5 mm. l. *Achene* .5 mm. l., margined, very minutely punctate, stigma very oblique, projecting about  $\frac{1}{4}$  beyond the perianth; longer perianth-lobe with a tuberculate dorsal appendage below the apex, three times as long as the lateral lobes.

35. *P. troyensis* *Fawc. & Rendle in Journ. Bot. l. 180* (1912); monœcious, herbaceous, stems creeping, puberulous; leaves of the same pair more or less unequal, broadly ovate and sometimes roundish, crenate-serrate in the upper half or two-thirds, or sometimes almost entire, 3-nerved, with sparse pellucid hairs on both sides, strigillose-puberulous on nerves beneath, membranous; stipules very short, roundish; cystoliths linear, rather smaller on the under surface; cymes with peduncles longer than petioles, paniculate, clusters close together and dense-flowered, male flower solitary amongst female. (Pl. 2, f. 7.) Type in Herb. N. York Bot. Gard.

Rocky wooded hill, Troy, *Britton*, 708!

Leaves .5-1 cm. l., .5-.9 cm. br., with the two lateral nerves produced to one-half or three-fourths of their length; petioles 1-2.5 mm. l. *Stipules* about .5 mm. l. *Peduncles* glabrescent, 5-7 mm. l. *Male flowers* subsessile. *Perianth* globulose, with few pellucid hairs, about .5 mm. l.; dorsal appendages, those of a pair equal, one pair bluntly and shortly triangular, the other linear, blunt. *Female flower* about .5 mm. l., larger segment .4 mm. l., the lateral about half the length. *Achene* (unripe) white with orange-red stigma, about .5 mm. l.

36. *P. Harrisii* *Urb. Symb. Ant. i. 299* (1899); monœcious, creeping; younger branches shortly pubescent; leaves ovate, base rounded or obtuse, apex obtuse or rounded, crenate from below the middle, 3-nerved, with a few pellucid hairs on upper surface or glabrate, underneath sparingly and very shortly pilose especially on nerves and margin; stipules rounded, persistent; peduncle of cyme more than half as long to twice as long as the leaf, bearing two to four approximate androgynous heads; achenes narrowly ovate. (Pl. 3, f. 22.)

Above Bath, *Purdie!* *Wilson!* *March!* Red Hills, *Harris!* foothills on S.E. of John Crow (Blake) Mts., *Harris & Britton!* Fl. Jam. 6881, 10,683.

*Stems* rooting; flowering branches erect or ascending 3-10 cm. l., branched or simple, glabrescent below, shortly pubescent above. *Leaves* .7-1.7 cm. l., .5-1 cm. br.; nerves reaching to about the middle; cysto-

liths linear, more conspicuous on upper surface; petiole 1-5 mm. l. *Stipules* 1.5-2 mm. l. *Peduncle* .7-2 cm. l., glabrous. *Male flowers* few in the apex of the capitulum, glabrous, 1 mm. l.; dorsal appendage narrowly triangular, barely half the length of the flower. *Achene* pale yellow, .5-.7 mm. l.; overtopping the larger perianth-segment by one-third.

Fl. Jam. 10,683 is a smaller plant of similar habit to the typical Fl. Jam. 6881, but has smaller cystoliths, and also shows slight differences in the flowers, especially the male, but we have only seen one male flower from this plant.

37. *P. obtusata* *Liebm.* in *Vidensk. Selsk. Skr. Kopenh.* ser. 5, ii. 300 (1851); dioecious or monoecious; stem pilose; leaves broadly ovate, apex pointed, obtuse or rounded at base, with large obtuse crenatures, 3-nerved (sub-5-nerved), glabrous above, pilose on the nerves underneath; stipules broadly ovate; cymes diffusely branched, with long peduncles, clusters few-flowered, separate.—*Wedd.* in *DC. Prodr. xvi. pt. 1*, 153; *Urb. Symb. Ant.* iv. 203. *P. pubescens* *Griseb.* *op. cit.* 159 (1859) (non *Liebm.*). *P. pubescens* var. *montana* *Wedd. loc. cit.* (Pl. 3, f. 23.) Type at Copenhagen.

*Distin!* *Prior!* Somerset Woods, near Mandeville, *Harris & Britton!* Fl. Jam. 10,608, 10,610.—Porto Rico, Montserrat, Martinique.

*Herb*; *stem* 1.5-2 dm. high, above pilose and strigulose. *Leaves* 3-6 cm. l., 2-3.5 cm. br., glaucous beneath; cystoliths linear, inconspicuous beneath; petioles 1-3.5 cm. l., shortly pilose. *Stipules* obtuse. *Cymes* solitary; peduncles 2-7 cm. l. *Male flowers* subsessile. *Perianth* 1.5 mm. l. (to apex of dorsal appendages), obovate-globulose, coherent at base with linear tapering appendages, .4-.6 mm. l. (in Jamaican specimen). *Female flowers* sessile or subsessile. *Achene* .75 mm. l., projecting slightly beyond median perianth-segment (.7 mm. l.), minutely muriculate.

38. *P. diffusa* *Wedd.* in *Ann. Sc. Nat. sér. 3, xviii.* 222 (1851); monoecious, stem frutescent below, procumbent, terete; branches diffuse, rooting, somewhat erect; leaves rhomboid-ovate, more or less acuminate, base obtuse, sharply serrate above the lower third or half, 3-nerved, upper surface with a few pellucid hairs or glabrate, the nerves beneath minutely puberulous; stipules very short, revolute, persistent; cymes androgynous, lax; peduncle much longer than the petiole.—*Griseb.* *op. cit.* 159 (in part); *Wedd.* in *DC. Prodr. xvi. pt. 1*, 154. *Urtica diffusa* *Sw.* in *Vet. Handl. Stockh.* vi. 30 (1785) & *Fl. Ind. Occ.* 290. (Pl. 3, f. 24.)

*Swartz!*

*Herb*; *stem* to 30 cm. and more, dichotomous, glabrous; branches rooting, somewhat erect, often 6 dm. and over, glabrous or (under a lens) minutely puberulous on younger branches. *Leaves* 1.5-3 cm. l., 1-2 cm. br.; nerves extending to the upper half of the limb, paler underneath; cystoliths, on the upper surface linear, of variable length and a few dots, underneath none or very minute; petiole .5-1 cm. l., minutely puberulous (under a lens). *Stipules* 1 mm. l. *Cymes* lateral and terminal, laxly branched, generally twice as long as the leaves, flowers very minute, pedicellate. *Male perianth* red, about .4 mm. l., subglobose, reddish; dorsal appendages ovate-triangular, obtuse, barely half the length of the flower.

39. *P. lamiifolia* Fawc. & Rendle in *Journ. Bot. l.* 180 (1912); monoecious, herbaceous, stems pubescent, hirsute on young branches; leaves of the same pair more or less unequal, ovate to elliptical-ovate, base obtuse or rounded, sparsely pilose with pellucid hairs on upper surface, pilose on nerves beneath, coarsely serrate-crenate in the upper two-thirds, 3-nerved from base, membranous; stipules very short, lunate; cystoliths small, linear, numerous on the upper surface; inflorescence with peduncles 3–2 cm. l., clusters crowded together at apex of peduncle. (Pl. 2, f. 8.) Types in Herb. N. York Bot. Gard. and in Herb. Mus. Brit.

Woodlands, near Newport, Manchester, Britton, 3205!

Stems 6–8 cm. l., weak, ascending, sometimes rooting below at the nodes, simple, densely covered with thin linear cystoliths, internodes 1–3 cm. l. Leaves 1–3 cm. l., 8–1·5 cm. br., with two lateral nerves produced to one-half to two-thirds of their length, the others not visible above; petioles 2·8 mm. l. Stipules 6–8 mm. l. Inflorescence solitary from axils of upper leaves, peduncles glabrous. Male flowers sessile or subsessile. Perianth about 1 mm. l., globose, coherent, sparsely hirsute; dorsal appendages apiculiform. Female flowers pedicellate. Achene ovate, 6 mm. l., projecting beyond the median segment of perianth, which is double as long as lateral segments; dorsal appendage of median tuberculate.

Var. *puberula* var. *nov.*; distinguished from the type in being ferruginously puberulous on the stems and under surface of the leaves, by numerous dot-like cystoliths scattered among the larger crescent-shaped ones, and by the somewhat larger shoulder of the median segment of the female perianth.

On rocks and logs in woodland. John Crow Mt., 1500 ft., Harris & Britton! Fl. Jam. 10,777.

40. *P. Hollickii* Fawc. & Rendle in *Journ. Bot. l.* 181 (1912); dioecious (male flowers only seen), herbaceous, stems pubescent, naked below, leafy at apex, leaves of the same pair more or less unequal, deciduous except at apex where 4–6 are crowded together, elliptical-ovate, obtuse at base, crenate-serrate in the upper two-thirds, 3-nerved; glabrous on upper surface, pilose with long pellucid hairs underneath on nerves, membranous; stipules 2–3 mm. l., broadly ovate, amplexicaul; cystoliths (on upper surface only) linear; cymes, male, with peduncles longer than petioles or even sessile, clusters dense-flowered and crowded together at the end of the peduncle. (Pl. 2, f. 9.) Types in Herb. N. York Bot. Gard., in Herb. Mus. Brit. and in Herb. Jamaica.

Union Hill, near Moneague, Britton & Hollick, 2754!

Stem 10–20 cm. l., ascending, rooting below at the nodes, simple or slightly branching, covered with thin linear cystoliths, lower internodes sometimes very long (to 9 cm. l.). Leaves 9–1·7 cm. l., 7–1·2 cm. br., with the two lateral nerves produced to about two-thirds of their length;

petioles 3-7 mm. l.; *inflorescence* in the axils of the upper leaves, peduncles glabrous, to 1.7 cm. l. *Male flowers* sessile or subsessile. *Perianth* 1.6 mm. l., ovoid; segments coherent to level of dorsal appendage, broadly ovate, the opposite pairs of unequal length; dorsal appendage triangular, nearly as long as rest of the perianth.

41. *P. silvicola* *Fawc. & Rendle* in *Journ. Bot. l.* 181 (1912); dioecious, herbaceous, shrubby below; stems ascending, simple or slightly branching, glabrous; leaves of the same pair more or less unequal, stalked, elliptical-ovate, somewhat shortly acuminate, subcordate at base, coarsely serrate in the upper one-third to two thirds, 3-nerved, nerves underneath connected reticulately; cystoliths on the upper surface linear, below thinner and smaller, on male plant glabrous, on female plant sparsely pilose on both sides, membranous; stipules 5-6 mm. l., elliptical, with amplexicaul base; cymes paniculate, peduncle longer than the petiole; male with peduncles 1-1.5 cm. l., clusters dense-flowered; female with peduncles 2.5-3 cm. l., clusters few-flowered. (Pl. 2, f. 10.) Type in *Herb. N. York Bot. Gard.*

In crevices of rocks; Peckham Woods, Upper Clarendon, 2500 ft., *Harris*, Fl. Jam. 10,948.

*Stem* 20-30 cm. l., sometimes rooting below at the nodes, 2-3 mm. br., densely covered with short broadly linear cystoliths, internodes 1.5-3 cm. l. *Leaves* 5-3 cm. l., 3-1.5 cm. br., with the two lateral nerves produced to about three-fourths of their length, the others not visible above; petioles 8-22 mm. l. *Cymes* solitary from axils of upper leaves, peduncles glabrous. *Male flowers* subsessile or with pedicels to 1 mm. l. *Perianth* 1.25 mm. l., coherent at base; lobes ovate with a long acuminate dorsal appendage, about half its length. *Female flowers* sessile or subsessile with pedicels to 3 mm. l.; larger lobe of perianth about .6 mm. l., hooded, with short subconical dorsal appendage about on a level with apex, lateral half as long, broadly elliptical.

42. *P. nigreseens* *Urb. Symb. Ant. i.* 299 (1899); monoecious or dioecious; stems near the apex with short reddish tomentum; leaves of each pair equal or subequal, ovate or rhomboid, base obtuse or subcuneate, apex obtuse, sometimes sub acuminate, 3-nerved, deeply crenate except at the base, glabrous on the upper surface, with short reddish tomentum on nerves underneath; stipules ovate, persistent; cymes unisexual, male laxly capitate, female paniculate, longer or shorter than the leaves. (Pl. 3, f. 25.)

*Macfadyen!* *McNab!* Blue Mt. Peak, about 7000 ft.; near Morse's Gap, 4800 ft.; *Harris!* St. George, *Watt!* Fl. Jam. 5425, 7350; Morse's Gap, 5000 ft., *G. Nichols!*

*Stems* woody below, erect, 15-30 cm. l. *Leaves* 1.5-5.5 cm. l., 1-3 cm. br.; nerves reaching to the upper third; petiole .5-2 cm. l., cystoliths linear, conspicuous on upper surface. *Stipules* 3-4 mm. l. *Cymes*, peduncle 1-7 cm. l. *Male flowers* stalked, pedicels 1-1.5 mm. l.; perianth obovate-globose, 1.4 mm. l., segments elliptical, dorsal appendage .3 mm. l., broadly apiculate. *Female flowers* subsessile. *Achene* ovate, with brown dots, .8-1 mm. l., projecting by one-half beyond the median

segment; median segment 6-7 mm. l., obovate when flattened, dorsal appendage spreading, tuberculate; lateral segments nearly as long, and similar.

### 5. BŒHMERIA Jacq.

Shrubs or small trees, or (*B. cylindrica*) suffrutescent or herbaceous, more or less pubescent; no stinging hairs. Leaves opposite or alternate, equal- or unequal-sided, toothed, 3-nerved; stipules free, deciduous. Flowers monœcious or diœcious, in globose clusters. Clusters almost always unisexual, sessile in axils or at the nodes or along the rhachis of a spike. Bracts small, scarious. Male flowers: perianth 3- or 4 (5)-partite, valvate;

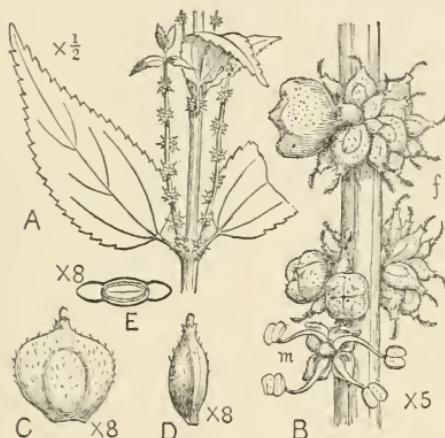


Fig. 20.—*Bœhmeria cylindrica* Sw.

- A, Portion of shoot with inflorescence.
- B, Enlarged portion of inflorescence showing male (m), and female (f) flowers.
- C, D, Fruit, front and side views.
- E, Fruit with seed in transverse section.

stamens 3 or 4 (5); ovary rudimentary. Female flowers: perianth tubular, contracted at the mouth, 2-4-toothed, sometimes in fruit enlarged; ovary included in perianth; stigma filiform, persistent, hairy on one side; ovule erect from the base. Achene enclosed in the marcescent perianth. Seed of similar form, with endosperm; cotyledons elliptical or ovate.

Species, more than 50, natives of the warmer regions of the world, mostly in the tropics.

Flower-clusters axillary, leaves alternate.

Female perianth glabrous, style 1-1.5 mm. l. .... 1. *B. jamaicensis*.

Female perianth hairy, style 3-5 mm. l. .... 2. *B. ramiflora*.

Flower-clusters in spikes.

Spikes pendulous, without leaves at apex. Leaves  
opposite ..... 3. *B. caudata*.

Spikes erect, with a few small leaves at apex. Leaves  
opposite on stem, alternate on branches ..... 4. *B. cylindrica*.

1. *B. jamaicensis* Urb. *Symb. Ant.* v. 329, 330, fig. B. (1907); monœcious or diœcious; leaves alternate, of two forms, the larger stalked, ovate-lanceolate or lanceolate, base obtuse and a little

unequal-sided, the smaller lanceolate, base rounded or obsoletely cordate, subequal-sided, all acuminate, base and acumen entire, the rest serrate-crenate, upper surface very sparsely pilose, underneath more so and especially on the nerves; flower-clusters axillary; female flower with style 1-1.5 mm. l.; perianth of fruit ellipsoidal-oblong, convex, not with winged margins, glabrous or very sparingly hairy at apex, usually stalked.—*B. ramiflora* *Griseb. Fl. Br. W. Ind.* 160 (1859) (non *Jacq.*) (with reference to the Jamaican plant).

*Wright!* *Bertero!* *Macfadyen!* *March!* *Bethabara, Wullsclaege!* 1022! *Mt. Diabolo; Moneague; Prior!* *Whitfield Hall Works; near Guava Ridge, 2000-2500 ft.; New Market, 1150 ft.; Harris!* *Fl. Jam.* 5184, 9559, 9560, 9561, 9958; *Grierfield, near Moneague, Britton,* 2657!

Shrub 6-10 ft. Leaves, the larger 15-6 cm. l., 4-1 cm. br., stalk 4-1 cm. l., the smaller 6-3.5 cm. l., 1.5-1 cm. br. Flower-clusters 2-5 mm. in diam. Male perianth 3-partite, scarcely 1 mm. l. Anthers 3. Female perianth 2-3-toothed.

2. *B. ramiflora* *Jacq. Sel. Stirp. Amer.* 246, t. 157 (1763) & *Ed. pict.* t. 236; monœcious or diœcious; leaves alternate, of two forms, the larger lanceolate, base acute or obtuse, unequal-sided, stalked, the smaller alternating, ovate-lanceolate, with semicordate base, sessile or subsessile, all acuminate, serrate, upper surface sparsely hairy, pubescent beneath; flower clusters axillary, unisexual; female flower, style 3-5 mm. l., perianth of fruit ovoid-lanceolate, not with winged margins, very shortly pilose, sessile.—*Wedd. in DC. Prodr. xvi. pt. 1,* 196; *Griseb. Fl. Br. W. Ind.* 160 (in part); *Urb. Symb. Ant. v.* 330. *Caturus ramiflora L. Mant.* 127 (1767); *Lam. Illustr. t.* 763, f. 1.

*Swartz* (in *Herb. Stockholm*)!

Shrub 6-8 ft. Leaves 20-7 cm. l., 6-2.5 cm. br., stalk 4-1.5 cm. l., shortly pilose, the smaller 7-2 cm. l. with very oblique base. Flower clusters 4-6 mm. in diam. Male perianth 3-partite, exceeding 1 mm. l. Anthers 3. Female perianth 2-toothed.

3. *B. caudata* *Sw. Prodr.* 34 (1788); diœcious; leaves large, opposite, ovate (sometimes broadly) to elliptical, acute to acuminate, at the base obtuse or rounded, serrate, upper surface flat or rugulose and rough-hispid, underneath pubescent; spikes simple, leafless, longer than the leaves, spreading or pendulous; fruiting perianth broadly obovate, much compressed, with a membranous margin, puberulous.—*Sw. Fl. Ind. Occ.* 279; *Miq. in Fl. Bras. iv. pt. 1,* 185, *tt.* 64, 65 *I.;* *Wedd. tom. cit.* 201; *Griseb. loc. cit.;* *Urb. loc. cit., fig. F.* *Urtica fruticosa &c. Browne Hist. Jam.* 338.

Nettle Tree.

*Wright!* *Shakspear!* *Swartz!* *Macfadyen!* *McNab!* *Manchester, Purdie!* *March!* *Blue Mts., Prior!* *Blue Mts., Cinchona, 5000 ft.; Harris!* *Fl. Jam.* 5238, 9557. *Clyde River, G. Nichols!*—*Mexico, S. America to Paraguay.*

Shrub or small tree, 6-16 ft. high. Leaves 15-25 cm. l., stalks very unequal in length, the longer sometimes half as long as the limb. Female perianth 2-4-toothed; fruiting perianth 2-2.5 mm. l.

4. *B. cylindrica* Sw. *Prodr.* 34 (1788); monœcious; stem generally simple, sometimes branched; leaves opposite on stem, alternate on branches, ovate to ovate-lanceolate, acuminate, base rounded or subcordate, stalked, grossly serrate, young leaves slightly pubescent on upper surface, at length glabrate, underneath puberulous on nerves; flower-clusters sessile on an interrupted spike, spikes simple, erect, generally with leaves at apex; fruiting perianth obovate-roundish, compressed, with thick margin, puberulous above.—*Wedd. Monogr.* 362, t. 11, f. 18-23 & in *DC. Prodr.* xvi. pt. 1, 202; *Griseb. loc. cit.*; *Urb. loc. cit. fig. G.* *B. littoralis* Sw. *loc. cit.* *B. cylindrica* var. *littoralis* *Wedd. loc. cit.* *Urtica racemosa* *humilior* *iners* *Sloane Cat.* 38 & *Hist. i. 124, t. 82, f. 2.* *Urtica cylindrica* L. *Sp. Pl.* 984 (1753). (Fig. 20.)

*Wright!* *Swartz!* near Ferry, St. Catherine, *McNab!* *Moneague, Prior!* *March;* New Market to Darliston, *Harris!* Fl. Jam. 9889.—Bermuda, Cuba, Porto Rico, Trinidad, continental America.

Plant herbaceous or suffrutescent, erect, 1-3 ft. high. Leaves 5-18 cm. l., 2.5-7 cm. br. Female perianth 4-toothed; fruiting perianth about 1.5 mm. l.

## 6. PHENAX Wedd.

Shrubs or suffrutescent herbs. Leaves alternate, stalked, crenate or serrate, 3-5-nerved; stipules free. Flowers monœcious

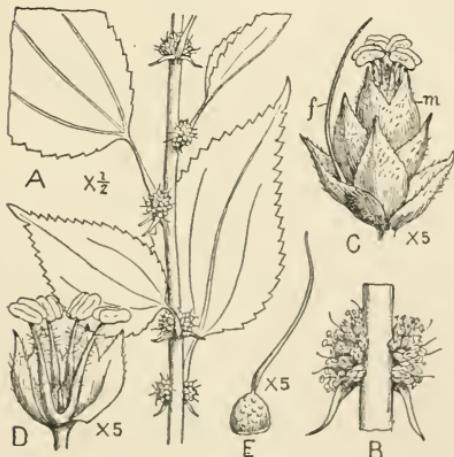


Fig. 21.—*Phenax hirtus* Wedd.

A, Portion of shoot with axillary flower-clusters.

B, Cluster.

C, A flower-spike with one male (m) and one female (f) flower.

D, Male flower opened.

E, Female flower.

(or sometimes dicecious), in dense axillary sessile clusters with ferrugino-scarious broad bracts; male flowers shortly stalked, female subsessile. Male flowers: perianth campanulate, divided above the middle into 4 (3 or 5) lobes. Stamens 4 (3-5). Ovary

rudimentary. Female flowers: perianth wanting. Ovary within a bract; stigma elongate, slender, persistent; ovule erect from the base. Achene somewhat compressed. Seed, with endosperm; cotyledons ovate.—Species 10, in tropical America.

*P. hirtus* Wedd. in *DC. Prodr. xvi. pt. 1*, 235<sup>38</sup> (1869). *P. urticaefolius* Wedd. in *Ann. Sc. Nat. sér. 4, i.* 192 (1854) & *Monogr. 495*; *Griseb. Fl. Br. W. Ind. 160* (in part). *Boehmeria hirta* Sw. *Prodr. 34* (1788) & *Fl. Ind. Occ. 285*. (Fig. 21.)

*Masson!* *Swartz!* *McNab!* *Purdie!* *Wilson!* *Cinchona, J.P.* 1306, *Hart!* *Blue Mts.*; *Cinchona, 5000 ft.*; *Harris!* *Fl. Jam.* 5183, 9558.—Central America and Andes.

Plants to 2.5 m. high. Leaves ovate, acuminate, sometimes subcordate, dentate-serrate, somewhat flat or rugose, sparsely hispid on upper surface, nerves underneath hirtellous, 3-12 cm. l., 1.5-5.5 cm. br.; stalk to 3 cm. l., hirtellous or puberulous. Flowers monoeious; clusters androgynous (flowers of each sex commonly equal in number), spherical, .8-1 cm. in diam. Male flowers with 4-lobed valvate perianth and 4 stamens. Achenes about  $\frac{1}{4}$  length of stigma.

## 7. ROUSSELIA Gaudich.

A perennial herb, tender, diffuse, with many branches. Leaves alternate, small, broadly ovate, entire; stipules small, free. Flowers very small, monoeious, axillary; male few in a small cluster, each flower subtended by a small linear bract; female

geminate with two bracts, bracts broad, foliaceous, free from each other, but accrescent to the flowers. Male flowers: perianth 4-partite, valvate. Stamens 4. Ovary rudimentary. Female flowers: perianth ovoid, contracted at the mouth, 2-4-toothed. Ovary straight; stigma filiform, curved, papilloso-plumose on one side; ovule erect from the base. Achene compressed, ovate, acute, with the enlarged perianth and attached bract persistent. Seed with scanty endosperm; cotyledons ovate.

Species one, in the West Indies.

*R. humilis* Urb. *Symb. Ant. iv.* 205 (1905). *R. lappulacea* Gaudich. in *Freye. Voy. Bot.* 503 (1826) & *Voy. Bonite, t. 98*; *Griseb. Fl. Br. W. Ind. 160*; *Wedd. in DC. Prodr. xvi. pt. 1*, 235<sup>34</sup>. *Urtica humilis* Sw. in *Vet. Handl. Stockh. vi.* 34 (1785).

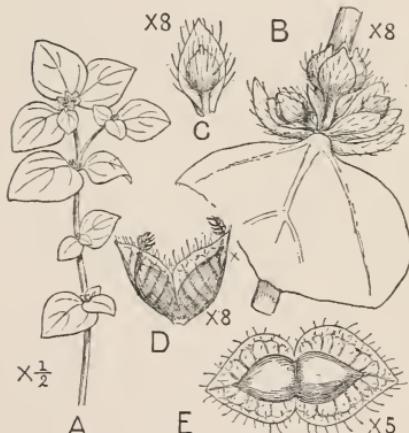


Fig. 22.—*Rousselia humilis* Urb.

A, Shoot bearing flowers.

B, Male cyme.

C, Bud of male flower with bract.

D, Pair of female flowers.

E, Pair of fruits with attached bracts.

*U. lappulacea* Sw. *op. cit.* *viii.* 69 *t. II. f. 2* (1787) & *Fl. Ind. Occ.* 317. (Fig. 22.)

Very common in rocky places and in crevices of walls; in fl. in March and April; Wright! Liguanea, Broughton! Swartz; Bethany, Wullschlaegel 1303! Wilson! Moneague, Prior! Jackson Town, Miss A. Moulton-Barrett! Holly Mount, Mt. Diabolo; New Market, 1150 ft.; Kempshot, 1100-1600 ft.; Harris! Fl. Jam. 8501, 9879, 10,324.—Cuba, Hispaniola, Porto Rico, St. Thomas, Dominica.

Plant 1.5-4 dm. Leaves 5-1.5(-3) cm. l. Female bract with hooked hairs. Flowers generally in axes of the terminal leaves of the branches. Male perianth red, hirtellous; stamens white. Female perianth green; stigmas white.

### FAMILY X. OLACACEÆ.

Shrubs or trees. Leaves alternate, entire. Flowers small, hermaphrodite. Calyx small, cup-shaped, persistent. Petals 4-5, free or united below into a campanulate corolla, inserted on the receptacle or at the margin of a disk, valvate. Stamens free or inserted on the petals. Disk well developed and adnate to the ovary, or wanting. Ovary (in Jamaican species) 3-celled below, with a central placenta at the apex; ovules 3, pendulous. Fruit a drupe, 1-celled, 1-seeded. Embryo minute, at the apex of the fleshy endosperm.

Species nearly 150, natives of tropical and subtropical regions of the world.

Petals bearded inside..... 1. *Ximenia*.  
Petals inserted at the margin of a disk..... 2. *Schœppia*.

#### 1. XIMENIA L.

Shrubs or trees, with or without spines. Flowers in short axillary cymes or solitary. Calyx with four or five teeth or lobes.

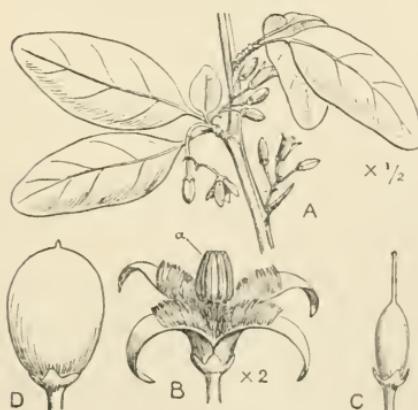


Fig. 23.—*Ximenia americana* L.

A, Flower-bearing shoot.  
B, Flower; *a*, anthers.  
C, Pistil.  
D, Drupe.

Petals 4 (or 5), hypogynous, narrow, bearded inside. Stamens free, twice as many as the petals. Drupe ellipsoidal.

Species 5, one in tropical America, Africa and Asia, one in Mexico, one in Brazil, one in South Africa, and one in New Caledonia.

*X. americana* L. *Sp. Pl.* 1193 (1753); *Wright Mem.* 266; *Griseb. Fl. Br. W. Ind.* 310; *Engl. in Fl. Bras.* xii. pt. 2, 9, t. 2, f. 1. *X. multiflora* *Jacq. Enum.* 19 (1760) & *Sel. Stirp. Amer. ed. piet.* t. 107. *X. aculeata* *Tuss. Ant.* iii. 100 t. 30 (1824). *X. montana* *Macf. Jam.* 121 (1837). *X. aculeata* flore &c. *Plum. Pl. Amer. (Burn.)* t. 261, f. 1 & *Ic. ined. v. t.* 258. *Amyris?* *arborescens* &c. *Browne Jam.* 209. (Fig. 23.)

*Wright!* *March*; near Browns Town, *Costa!* Montego Bay, *Austin!* Content Road, 3000 ft.; Potsdam, St. Cruz Mts., 2600 ft.; *Harris!* *Fl. Jam.* 6013, 9749.

Shrub or tree, 10-40 ft. high. Twigs angled. Leaves 3·5-6 cm. l., 2-4 cm. br., elliptical, apex obtuse, sometimes mucronate or emarginate, cuneate at base. Flowers sweet-scented. Petals 6-9 mm. l., white, linear; hairs on inside very dense. Drupe yellow, about the size of a pigeon's egg, flesh subacid-sweet, edible.

## 2. SCHŒPFIA Schreb.

Glabrous shrubs or small trees. Flowers in short racemes which are solitary or clustered in the axils. Calyx cup-shaped. Disk adnate to the ovary with an entire margin, increasing as the ovary ripens, almost enveloping the fruit. Petals 4-6,

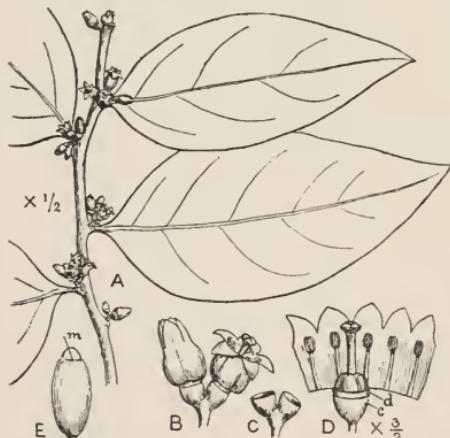


Fig. 24.—*Schœpflia multiflora* Urb.

A, Flower-bearing shoot.

B, Flowers.

C, A pair of empty calyxes.

D, Flower with corolla cut open; *c*, calyx; *d*, disk appearing above calyx.

E, Drupe; *m*, margin of disk.

inserted at the margin of the disk, cohering into a tubular-campanulate corolla, free at the apex. Stamens equal in number and opposite to the petals, adnate to the corolla-tube. Ovary half-immersed in the disk. Drupe ringed near the apex with the margin of the adnate disk.

Species 18, natives of tropical America and Asia.

Flowers sessile, calyxes coherent—

Leaves ovate to elliptical ..... 1. *S. chrysophylloides*.  
Leaves elliptical-lanceolate ..... 2. *S. angustata*.

Flowers pedicellate, calyxes separate—

Flowers numerous in clusters at the nodes,  
peduncles wanting or very short ..... 3. *S. multiflora*.  
Peduncles 1 or 2 at the nodes, 1-1.5 cm. l. ... 4. *S. Harrisii*.

1. ***S. chrysophylloides*** *Planch.* in *Ann. Sc. Nat. sér. 4, ii.* 261 (1854); leaves ovate to elliptical, flat or plicato-falcate; cuneate at base, apex obtuse; peduncles, one or more, axillary, 2-(1-3)-flowered; flowers sessile, calyxes coherent.—*Griseb. Fl. Br. W. Ind.* 709; *Urb. Symb. Ant.* v. 182. *S. Marchii* *Griseb. op. cit.* 310 (1860). *Diploocalyx chrysophylloides* *A. Rich.* in *Sagra Cub. xi.* 81, t. 54 (1850).

*Purdie*; *March*; on rocky ground, coast between Portland Point and Rocky Point, *Harris*!—Cuba.

*Tree* 25 ft. high. *Leaves* 4-7 cm. l., 2-3 cm. br.; *petiole* 4-8 mm. l. *Peduncles* 1-4 mm. l. *Flowers* dimorphic, long- and short-styled. *Corolla* campanulate, 3-3.5 mm. l., style just protruding from the corolla-tube or included. *Fruit* narrowly obovate, 6.5-7.5 mm. l., 4-4.5 mm. thick.

2. ***S. angustata*** *Urb. Symb. Ant.* vi. 6 (1909); leaves elliptical-lanceolate, cuneate at base, somewhat acuminate above, margin flat; peduncles solitary (rarely 2 or 3), axillary, 2-3-flowered; flowers sessile, calyxes coherent.

Sandy soil on dry rocky hills near Port Henderson, *Harris*! Fl. Jam. 10,154.

*Tree* to 18 ft. high, trunk 8 inches thick, bark ridged longitudinally, the older branches terete, greyish-white, those of the first year angled. *Leaves* 4-5 cm. l., 1.5-2 cm. br.; *petiole* 4-6 mm. l. *Corollas* (not seen) yellow with a dark crimson eye (*fide Harris*). *Fruit* obovate, 6-7 mm. l., about 5 mm. thick.—Very near the last species; better material desired.

3. ***S. multiflora*** *Urb. Symb. Ant.* v. 184 (1907); leaves ovate or ovate-elliptical, rounded or obtuse at the base, apex obtuse and shortly acuminate, flat; flowers numerous in clusters at nodes from which the leaves have generally fallen; peduncles 1-2 mm. l. or wanting, 2-(3)-flowered; flowers subsessile; calyxes separate. *S. arborescens* *Griseb. op. cit.* 310 (1860) (as regards the Jamaican specimen). (Fig. 24.)

*Prior*; Chester Vale, Blue Mts.; Stanmore Hill, St. Cruz Mts., 2200 ft.; *Harris*! near Mile Gully, 1700 ft.; *Harris* & *Britton*! Fl. Jam. 5345, 9952, 10,620.

*Tree* to 30 ft. high, with longitudinal furrows in the bark. *Leaves* 6-13 cm. l., 3-7 cm. br.; *petioles* 3-5 mm. l. *Corolla* greenish-yellow, campanulate, about 4-5 mm. l. *Fruit* ovoid 9-10 mm. l., 7.5 mm. thick.

4. ***S. Harrisii*** *Urb. Symb. Ant.* v. 185 (1907); leaves ovate-oblong to oblong-lanceolate, produced at the base into the short petiole, apex obtuse, flat; peduncles 1-3 at nodes from which the

leaves have sometimes fallen, 1-1.5 cm. l., 2-(1-3)-flowered; pedicels 1-2 mm. l.; calyxes separate.

Near Troy, 2500 ft.; *Harris!* Fl. Jam. 8799.

*Shrub* 15 ft. high. *Leaves* 4.5-6 cm. l., 1.5-2.5 cm. br. *Buds* rounded. *Flower-parts* in sixes (or fives). *Stigma* 3-lobed.

## FAMILY XI. LORANTHACEÆ.

Shrubs parasitic on trees or shrubs. Leaves opposite, reduced in some species to small scales. Inflorescence various, racemose, spicate or fasciculate. Flowers regular, hermaphrodite or unisexual. Perianth double or simple. Calyx epigynous, annular or cupulate, entire or shortly toothed. Petals epigynous, 3 or 6, valvate, free or united into a tube. Stamens as many as the petals, affixed to their base or centre, and generally shorter. Anthers normally 2-celled, cells parallel or diverging, dehiscing longitudinally, sometimes 1-celled, with the cells confluent and dehiscing by a transverse pore or chink. Disk epigynous, sometimes wanting. Ovary inferior; ovule undeveloped until after pollination. Fruit baccate. Seed one, with or without endosperm; embryo in the centre of the endosperm.

The members of this family are generally known by the popular names, God bush and Mistletoe.

Species between 400 and 500, very widely dispersed through the tropics, rarer in the temperate regions.

Corolla of 6 petals.

Corolla very long, about 7.5 cm. l. (3 inches)..... 1. *Psittacanthus*.

Corolla small, not more than 3 mm. l. ( $\frac{1}{8}$  inch).

Flowers not sunk in pits ..... 2. *Phthirusa*.

Flowers sunk in pits in spikes which are not articulated ..... 3. *Oryctanthus*.

Corolla of 3 petals.

Leaves opposite. Flowers more or less sunk in pits in articulated spikes ..... 4. *Phoradendron*.

Leaves replaced by scales or altogether wanting.

Flowers more or less sunk in pits in articulated spikes ..... 5. *Dendrophthora*.

Flowers not sunk in pits. Internodes continuous ..... 6. *Eubrachion*.

### 1. PSITTACANTHUS Mart.

Shrubby with no aërial roots. Leaves opposite. Flowers large, coloured yellow, sometimes tinged with red, hermaphrodite, parts of the flower in sixes; 3 or 2 flowers grouped together in racemes, each flower with a bracteate cupule. Calyx forming a narrow ring above the ovary. Petals free. Stamens alternately longer and inserted higher, and shorter and inserted lower;

filaments filiform, adherent to the petals below, free above; style cylindrical-filiform, as long as the petals; stigma capitate, 2-lobed. Berry fleshy. Seed without endosperm.

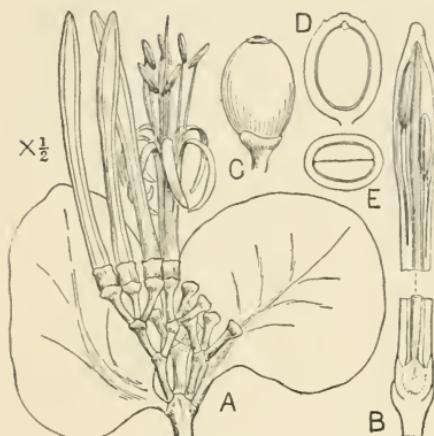


Fig. 25.—*Psittacanthus claviceps* Eichl.

A, Portion of shoot with inflorescence.

B, Flower cut lengthwise.

C, Fruit.

D, Fruit cut lengthwise, showing the embryo with its large cotyledons filling the seed.

E, Fruit cut transversely.

Species about 50, natives of the West Indies and tropical America.

*P. claviceps* Eichl. in *Fl. Bras.* v. pt. 2, 26 (1868); *Urb. in Engl. Bot. Jahrb.* xxiv. 13 (1897).—*Scurrula parasitica* foliis ovatis &c. *Browne Hist. Jam.* 197 (1756). *Loranthus americanus* *L. Syst. ed.* 10, 988 (1759) (in part) & *Amœn. v.* 396 (non *L. Sp. Pl.* 331). *L. Jacquinii DC. Prodr.* iv. 308 (1830) (in part); *Macf. Jam. ii.* 199 (excl. syn. *Jacq.*). *L. claviceps* *Griseb. Fl. Br. W. Ind.* 311 (1860). (Fig. 25.)

Hunts Bay and Palisadoes, *Browne*; *Wright!* *Broughton!* *Macfadyen!* near Bath, *Purdie!* Mt. Diablo, *McNab!* *Wullschlaegel*; near Newton, *Fawcett!* Mt. Lebanon; near Gordon Town; Watson's Hill, 2200 ft.; Long Mountain, 600 ft.; *Harris!* *Fl. Jam.* 6009, 6209, 6210, 8177, 8838, 10,015. Found growing on *Hippomane Mancinella* (*Browne*), *Eugenia Jambos*, *Coccoloba* sp. and *Metopium Linnwi.*

Leaves broadly ovate, obovate or ovate-oblong, rounded at apex, pinnerved. Inflorescence terminal, umbellate-racemose or elongate-racemose, the ultimate branches bearing 3 or 2 flowers; sometimes also from the axils of the highest leaves. Unopened flower 6-7.5 cm. l., straight or curved, thickened at the apex. Corolla tawny yellow, sometimes tinged with red. Fruit black, about 1.5 cm. l.

Var. *longifolius* Kr. & Urb. in *Engl. Bot. Jahrb.* xxiv. 14 (1897); leaves oblong-lanceolate or obliquely lanceolate, narrowed at the base into the petiole, 8-9 cm. l., about 2.5 cm. br.; about 3½ times longer than broad.—*Loranthus Jacquinii* var. *longifolius* *DC. Prodr.* iv. 308 (1830).

*Tussac.*

## 2. PHTHIRUSA Mart.

Shrubby. Roots inside and outside the cortex of the host, those outside creeping along a branch and inserting haustoria. Leaves opposite, decussate, more or less leathery. Inflorescence, flowers solitary or in groups of three arranged in terminal and axillary spikes, racemes or panicles. Bract and bracteoles fleshy, cupuliform at base. Flowers very small, 3 mm. l., greenish, sometimes tinged with red, hermaphrodite or dioecious (?), parts of the flower in sixes. Calyx in the form of an elevated margin. Petals free, fleshy, spreading in flower. Stamens, the longer inserted higher alternating with shorter inserted lower; filaments adnate below to the petals, fleshy, anthers with connective more or less apiculate, those of the longer stamens smaller. Ovary with an annular disk; style stout, columnar. Berry crowned with the persistent calyx; embryo straight, surrounded by and slightly shorter than endosperm.

Species about 45, natives of the West Indies and tropical South America.

§ 1. Flowers in groups of 3, with bract and bracteoles more or less connate under the group. (Fig. 26.)

Inflorescence with brown scurfy scales .....	1. <i>P. lepidobotrys</i> .
Inflorescence not scurfy .....	2. <i>P. jamaicensis</i> .

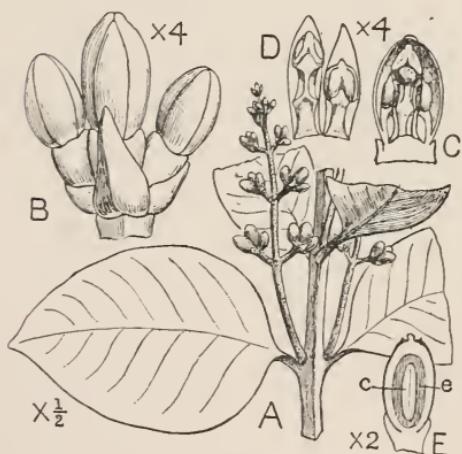


Fig. 26.—*Phthirusa lepidobotrys*  
Eichl.

A, Portion of shoot with inflorescence.

B, Single cluster of flowers.

C, Upper portion of flower cut lengthwise.

D, Petals with stamens.

E, Fruit cut lengthwise; *e*, endosperm; *c*, cotyledons.

§ 2. (Dendropemon) Flowers not in threes. Bract with the sterile bracteoles connate under each flower into a cup-shaped, somewhat entire cupule, produced anteriorly. (Fig. 27.)

Leaves elliptical, 1-2 cm. l.....	3. <i>P. parvifolia</i> .
Leaves shortly obovate to elliptical, 2.5-4.5 cm. l., 1-2 cm. br.....	4. <i>P. pauciflora</i> .
Leaves broadly ovate to roundish-elliptical, 5-3.5 cm. l., 3.5-2.5 cm. br.....	5. <i>P. Harrisii</i> .

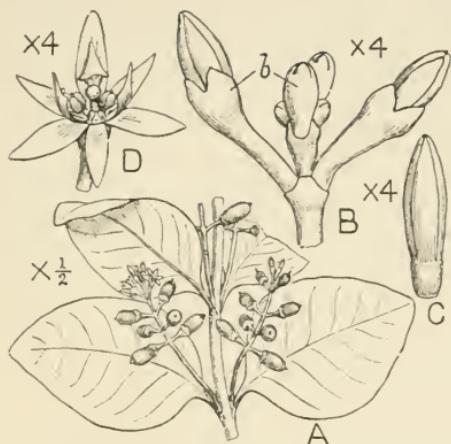


Fig. 27.—*Phthirusa Harrisii*  
comb. nov.

A, Portion of shoot with inflorescence.  
B, Apex of inflorescence; *b*, bracts.  
C, Flower-bud.  
D, Open flower.

§ 1. Flowers in groups of three, with bract and bracteoles more or less connate under the group.

1. *P. lepidobotrys* Eichl. in *Fl. Bras. v. pt. 2*, 134<sup>i</sup> & 333 (1868); branches 4-angled or compressed-4-angled above, smooth, marked at the angles which are rather acute with an elevated corky line; leaves ovate or broadly ovate, cuspidate, sometimes acuminate; inflorescence of 3-flowered clusters in a raceme, with brown scurfy scales; flowers hermaphrodite; bud ellipsoid; anthers of two forms, those of the longer filaments triangular, without pollen, those of the shorter larger, shortly ovate, with the thick connective produced; berries spreading, oval.—*Urb. in Engl. Bot. Jahrb. xxiv. 15* (1897). *Loranthus lepidobotrys* Griseb. *Fl. Br. W. Ind.* 311 (1860); Eichl. *tom. cit. 62.* (Fig. 26.)

Moneague; near Browns Town, *Prior*! near Cinchona, 5000 ft., Fawcett! Old England, 3000 ft.; Cinchona; *Harris*! Lyndhurst, near Greenvale, *Harris & Britton*! *Fl. Jam.* 6201, 6211, 6311, 6390, 10,624; Cinchona, *G. Nichols*! Growing on *Baccharis scoparia*, *Psychotria undata*, *Eupatorium triste* and *Citrus*.

Leaves 5-10 cm. l., 3·5-7·5 cm. br.; petioles 1 cm. l. Inflorescence 5-11 cm. l.; pedicels of the clusters 2-5 mm. l. Corolla 2·5-3 mm. l., yellow. Berries 6-7 mm. l., green tipped with rose.

2. *P. jamaicensis* Kr. & Urb. in *Engl. Bot. Jahrb. xxiv. 15* (1897); branches terete, the younger 4-angled at the apex; leaves ovate or oval, somewhat acute; inflorescence, 3-flowered clusters in a compound raceme, not scurfy; male flowers only seen; buds ovate-oblong; anthers somewhat unequal but all bearing pollen.—*P. Theobromæ* Eichl. in *Fl. Bras. v. pt. 2*, 56 (1868) (so far as regards the Jamaican plant). *Loranthus avicularius* Griseb. *Fl. Br. W. Ind.* 312 (1860) (non *Mart.*).

*Purdie*!

Leaves 4-7 cm. l.; petioles about 1 cm. l. Bracts ovate or ovate-lanceolate, 1·5-2 mm. l.; pedicels of clusters none or lowest 2 mm. l. Flowers greenish-white; perianth 3 mm. l.

§ 2 (Dendropemon) Flowers not in threes. Bract with the sterile bracteoles connate under each flower into a cup-shaped, somewhat entire cupule, produced anteriorly.

3. *P. parvifolia* Eichl. in *Fl. Bras. v. pt. 2*, 55 (1868); leaves small, elliptical, obtuse, sometimes mucronate, 1-2 cm. l., 1.5-1.3 cm. br.; petiole 1-4 mm. l.—*Loranthus parvifolius* Sw. *Prodr.* 58 (1788) & *Fl. Ind. Occ.* 628; *Macf. Jam. ii.* 199. *Dendropemon parvifolius* Steud. *Nomencl. ed. 2, i.* 491 (1841); *Urb. in Engl. Bot. Jahrb. xxiv.* 21.

Blue Mts., *Swartz!* Cinchona, 5000 ft., *Fawcett!* *C. Nicholls!* Newhaven Gap, 5600 ft., *Harris!* *Fl. Jam.* 6212, 9198; Newhaven Gap, *G. Nichols!* Growing on *Podocarpus Urbanii*, *Baccharis scoparia*, *Dodonaea viscosa*, *Vaccinium meridionale*, *Clethra tinifolia* and *Ilex montana* var. *occidentalis*.—Hispaniola.

Stem very much branched, branches terete, more or less compressed when young, brown-scaly; internodes 1.5-2 cm. l. Inflorescence scaly, subumbellate on short axillary peduncles, 1-6-flowered, generally less than 1 cm. l.; flowers subsessile. Bud cylindrical-oblong slightly constricted about the middle, 2-2.5 mm. l. Stamens of two forms, the alternate longer, without pollen, bearing a thin membranous triangular connective, the shorter bearing roundish apiculate anthers. Berries oblong, 5 mm. l., about 2.5 mm. br.

4. *P. pauciflora* Eichl. loc. cit.; leaves shortly obovate to elliptical, apex rounded or obtuse, rarely emarginate, base narrowed into the petiole, 2.5-4.5 cm. l., 1-2 cm. br.; petiole 3-6 mm. l.—*Loranthus pauciflorus* Sw. *Prodr.* 58 (1788) & *Fl. Ind. Occ.* 627; *Griseb. Fl. Br. W. Ind.* 312 (in part); *Urb. tom. cit.* 71. *L. montanus* *Macf. Jam. ii.* 198 (1850). *L. parvifolius* *Griseb. loc. cit.* (in part). *Dendropemon pauciflorus v. Tiegh.* in *Bull. Soc. Bot. France, xlvi.* 170 (1895). *D. montanus* *Kr. & Urb.* in *Engl. Bot. Jahrb. xxiv.* 23 (1897).

*Swartz!* *Macfadyen!* near Bath; Manchester; *Purdie!* *Wullschlaegel!* *March!* Blue Mts.; *Moneague!* *Prior!* *Stony Hill, J.P.* 682, *Morris!* near Cinchona, 5000 ft., *Fawcett!* *Whitfield Hall Works*; *Mavis Bank*; *Mt. Moses*; *Petersfield*, 2500 ft.; *Yallahs Valley*, 1700 ft.; *Harris!* *Fl. Jam.* 6041, 6213, 6218, 6391, 6403, 6811. Blue Mt. Peak, *G. Nichols!* Growing on *Duranta Plumieri*, *Ocotea leucoxylum*, *Bucida capitata*, *Acacia villosa* and *Faramea odoratissima*.

Stem with branches terete, the younger twigs sometimes compressed and with the inflorescence brown-scaly. Inflorescences 1.5-3 cm. l., laxly 6-10-flowered; peduncles terete or subcompressed, slender; pedicels 3-5 mm. l.; bracts and bracteoles connate into a cupule with the apices free, shortly triangular. Calyx hidden by the cupule. Bud oblong-elliptical, 3 mm. l. Stamens of two forms, the alternate longer without pollen and with a triangular acuminate connective; the shorter having roundish shortly apiculate anthers. Berries oblong, 7 mm. l., 2.5 mm. br., dark green with yellow apex.

5. *P. Harrisii* comb. nov.; leaves broadly ovate to roundish-elliptical, base rounded or subtruncate more or less produced into the petiole, apex very obtuse or rounded, 5-3.5 cm. l.,

3·5-2·5 cm. br.; petiole 5-7 mm. l.—*Dendropemon Harrisii* Urb. *Symb. Ant.* vi. 7 (1909). (Fig. 27.)

Jenman! between Llandovery and Runaway Bay, Harris! Fl. Jam. 10,371. Growing on *Piscidia Erythrina*.

Stem pendent with branches 60 cm. l., with the young twigs of the first year terete, and, as well as the inflorescences, brown-scaly; internodes 3·5-2·5 cm. l. Inflorescences 3-1·5 cm. l. (-6, Urban), 5-20-flowered; pedicels 3-4 mm. l.; bracts and bracteoles free above. Calyx more or less hidden by the cupule. Bud 3 mm. l. Petals lanceolate-linear, 3 mm. l., 6 mm. br. Anthers, 3 without pollen with a long, lanceolate connective, 3 fertile shortly apiculate. Style 2 mm. l. Berries 7 mm. l.

### 3. ORYCTANTHUS Eichl.

Shrubs erect, with roots creeping along branches of the host and inserting haustoria. Inflorescence spicate, flowers solitary, sunk in pits which are opposite decussate on the simple fleshy rachis. Bracts forming a margin below the pits. Flowers very small, hermaphrodite, parts of the flower in sixes. Calyx reduced to a narrow margin. Petals free, cohering in the ovoid or oblong bud. Stamens, those longer and inserted higher alternating with the shorter inserted lower; filaments adnate below to the petals, connective produced into an apiculus; anthers with anterior cells smaller than the posterior. Ovary with an annular disk. Berry with umbilicate apex, and including a viscid layer; seed with endosperm; embryo straight, lying in the axis of the endosperm.

Species about 12, natives of tropical America and the West Indies.

*O. occidentalis* Eichl. in *Fl. Bras.* v. pt. 2, 89 (1868); Urb. in *Engl. Bot. Jahrb.* xxiv. 29. *Viscum latioribus* &c. Sloane

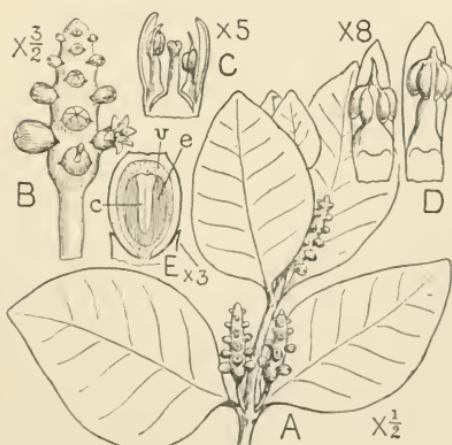


Fig. 28.—*Oryctanthus occidentalis*  
Eichl.

A, Portion of shoot with axillary spikes.

B, Spike.

C, Upper portion of flower in section.

D, Petals with stamens.

E, Fruit cut lengthwise; v, viscid layer; e, endosperm; c, cotyledons.

*Cat.* 168 & *Hist.* ii. 92, *t.* 200, *f.* 2. *Scurrula parasitica* foliis majoribus &c. *Browne Hist. Jam.* 197. *Loranthus occidentalis* *L. Syst. ed.* 10, 988 (1759) (excl. syn. *Loeff.*) & *Amen. v.* 396; *Macf. Jam. ii.* 198; *Griseb. Fl. Br. W. Ind.* 313 (excl. syn. *Benth.*). (Fig. 28.)

*Sloane Herb. vi.* 108! *Shakspear!* *Wright!* *Broughton!* *Bertero!* *Distin!* *Gosse;* *Macfadyen;* *Wullschlaegel;* *Prior!* *March;* *Oersted;* *Wareka* *Road;* *Campbell;* *Whitfield Hall Works;* *Road to Brandon Hill, 100 ft.*; *Mavis Bank, 2500 ft.*; *Chester Vale, 3000 ft.*; *Mona Woodland, 1000 ft.*; *Charlemont, near Ewarton, 1000 ft.*; *Road to Constitution Hill, 1000 ft.*; *banks of Black River, Lacovia;* *Harris!* *Fl. Jam.* 6012, 6342, 6354, 6382, 6394, 6396, 6542, 6572, 6710, 6812, 9757. *Growing on* *Punica,* *Persea* *gratissima,* *Phœbe montana,* *Theobroma Cacao,* *Serjania,* *Nectandra,* *Diphollis,* *Rondeletia* and *Vitis.*

*Branches* when young scurfy. *Leaves* variable in form, roundish or broadly to narrowly ovate or oval, 3-8 cm. l., 2.5-5.5 cm. br. *Spikes* axillary, solitary, rhachis smooth, peduncle 5-1.2 cm. l., scurfy. *Berries* black, ovate, 4-5 mm. l.

#### 4. PHORADENDRON Nutt.

Shrubs; branches articulated at the nodes. Spikes axillary or terminal, articulated, with two small fleshy bracts at each joint. Flowers superposed in 2, 4, or 6 rows in each joint, dioecious or

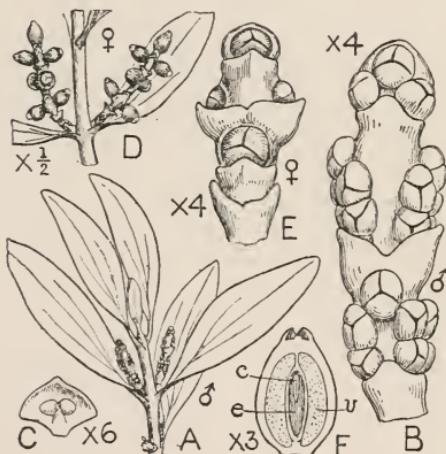


Fig. 29.—*Phoradendron Wattii*  
Kr. & Urb.

- A, Portion of male shoot with axillary spikes.
- B, Male spike.
- C, Petal with stamen.
- D, Female spikes in fruit.
- E, Female spike in flower.
- F, Fruit cut lengthwise; *v*, viscid layer; *e*, endosperm; *c*, embryo.

monœcious, more or less immersed in the rhachis. Male flower: petals 3, united at base. Anthers at the base of the petals, almost sessile, 2-celled above, cells longitudinally dehiscing. Female flower: petals 3. Berry crowned by the petals and including a thick viscid layer. Seed with a small embryo enclosed in copious endosperm.

Species about 100, natives of West Indies, tropical America, and a few in North America.

§1. Scale-sheaths (*i.e.* pairs of scales more or less united at the base to form a sheath) only in the lowest internode of a branch, none in the other internodes.

Flowers in 4 rows, besides two odd at the top of the joint, forming a fifth and sixth row.

Berries not granulate above.

Branches usually acutely 4-angled or even slightly winged. Joints 14-34-flowered. Spikes 4-9 cm. l.

Branches 4-angled. Joints 6-18-flowered. Spikes 7-2.5 cm. l.

Leaves lanceolate-linear to oblong-lanceolate, 4-10 times longer than broad.

Leaves obovate to elliptical-oblong, 1½-3 times longer than broad.

Branches terete or the younger more or less compressed or 2-edged or even somewhat 4-angled.

Diœcious—

Male joints 10-14-flowered, female 2-flowered.

Male unknown, female median joint 4-8-flowered.

Monœcious.

Berries, when young, granulate above.

Flowers (female) in 2 rows, 2 in each joint.

Leaves narrowed somewhat equally above and below.

Younger branches terete or obtuse-angled. Leaves leathery.

Younger branches acute-angled or 2-edged. Leaves somewhat thick-papery

Leaves obovate to narrowly obovate-oblong.

Flowers in 6 rows.

§2. Scale-sheaths in all the internodes.

Leaves pinninerved. Flowers in 4 rows.

Leaves with principal nerves from the base.

Flowers in 6 rows.

1. *P. tetrapherum*.

2. *P. rubrum*.

3. *P. trinervium*.

7. *P. Wattii*.

4. *P. Fici*.

5. *P. crenulatum*.

2. *P. rubrum* v. *gracile*.

6. *P. Wattii*.

7. *P. Campbellii*.

3. *P. trinervium* v. *domingense*.

8. *P. Grisebachianum*.

9. *P. latifolium*.

10. *P. flavens*.

§ 1. Scale-sheaths only in the lowest internode of a branch, none in the other internodes.

1. *P. tetrapherum* Kr. & Urb. in *Engl. Bot. Jahrb.* xxiv. 35 (1897); branches usually acutely 4-angled or with narrow wings at the 4 angles; leaves elliptical-oblong, oblong-lanceolate, obovate, or obovate-oblong, often oblique; spikes 4-9 cm. l.; flowers in 4 rows, rarely 5 (besides 2 odd, at top of internode), 12-32 in each joint; berries smooth.—*Urb. Symb. Ant.* iv. 207.

Macfadyen! near Hope Gardens, 800 ft., Harris! Fl. Jam. 6393, 6545, 6576, 6926. Growing on *Phoradendron rubrum* var. *gracile*, *Pithecolobium dulce* and *Guazuma tomentosa*.—Porto Rico, Martinique.

*Internodes* 3–7 cm. l. *Leaves* 4–10 cm. l., 1·5–4 cm. br., apex obtuse or rounded, sessile but base narrowed and petiole-like, 5-nerved. *Spikes* 4–6-jointed, monococious, androgynous, solitary or 3 together in the axils. *Flowers* 2–6 highest male, deciduous, the rest all female. *Berries* 3–3·5 mm. l., white, obovate-globose or globose.

2. *P. rubrum* *Griseb. Fl. Br. W. Ind.* 314 (1860); branches 4-angled; leaves oblong-lanceolate, lanceolate or lanceolate-linear; spikes 1–2 cm. l.; flowers in 4 rows (with 2 odd at top of internode), 6–18 in the joint; berries smooth.—*Kr. & Urb. in Engl. Bot. Jahrb. xxiv.* 42. *P. quadrangulare* *Kr. & Urb. tom. cit.* 35 (1897). *Viscum foliis latioribus &c.* *Catesby Nat. Hist. Carol.* ii. 81, t. 81. *Viscum rubrum* *L. Sp. Pl.* 1023 (1753); *DC. Prodr.* iv. 281. *V. Kunthianum* *DC. Prodr.* iv. 283 (1830). *V. quadrangulare* *DC. loc. cit.* Type in *Herb. Mus. Brit.*

*Krebs*; *March*.—Bahamas, Cuba, Hispaniola, Porto Rico, Guadeloupe, Dominica, St. Vincent, Trinidad, tropical America to Argentina.

*Leaves* 4–9 cm. l., 1·5–1·5 cm. br., apex obtuse or acute, sessile, but base narrowed and petiole-like, with 3 (sometimes 5) nerves from the base. *Spikes* 3–4-jointed, irregularly androgynous or female. *Berries* yellow or red, shortly ovoid or globulose, 3–4 mm. l., crowned by the corolla, which is almost always closed.

*Viscum rubrum* *L.* was founded on *Catesby*'s description and figure. The corresponding specimens (from the Bahamas) are preserved among *Catesby*'s plants in *Herb. Sloane* (ccxxii. 2 & 8). The stem is quadrangular, not terete and compressed, and the plant is identical with *P. quadrangulare* *Kr. & Urb.*

Var. *gracile*; leaves lanceolate-linear, 4–5 cm. l., 1·5–1 cm. br.; spikes 2–3 cm. l., 4–7-jointed, male or female or irregularly androgynous; male flowers 22–30, female 10–18 in each joint; berries, the younger obovate and slightly tuberculate-granulate above, the mature oval-globulose, becoming smooth.—*P. quadrangulare* var. *gracile* *Kr. & Urb. tom. cit.* 37.

Near Gordon Town (male), *Ball*! Wareka Road; Windward Road; *Campbell*! near Hope Gardens, 800 ft.; above Hope Mines, 900 ft.; Halberstadt, 2900 ft.; *Harris*! *Fl. Jam.* 6384, 6392, 6400, 6544, 6577, 6585, 6661, 6927. Growing on *Guazuma tomentosa*, *Pithecolobium dulce* and *Crescentia Cujete*.

3. *P. verticillatum* *comb. nov.*; branches 4-angled, becoming 2-angled or terete below, smooth; leaves obovate to elliptical-oblong; spikes androgynous or subunisexual, 1·7–2·5 cm. l.; flowers in 4 rows (with 2 odd at top of internode), 4–12 in each joint; berries ovoid or ovoid-globulose.—*P. trinervium* *Griseb. Fl. Br. W. Ind.* 314 (1860); *Kr. & Urb. in Engl. Bot. Jahrb. xxiv.* 37; *Urb. Symb. Aut.* iv. 208. *Viscum verticillatum* *L. Sp. Pl. ed. 2*, 1452 (1763) (excl. syn. *Sloane*); *Wright Mem.* 303. *V. verticillatum* *L. Sp. Pl.* 1023 (1753) is founded on *Sloane Hist.* ii. 93, t. 201, f. 2, which the specimen in *Herb. Sloane*

shows to be a monstrous form of *Cissus sicyoides*. V. parasiticum, ramulis &c. *Br. Hist. Jam.* 356. V. caule verticillato *Plum. Pl. Amer. (Burm.)* t. 258, f. 2 & *Ic. ined.* v. 310. V. trinervium *Lam. Encyc. iii. 57 (1789)*; *DC. Prodr. iv. 280*. V. tetragonum *DC. Prodr. iv. 282 (1830)*. V. oblongifolium *DC. Prodr. iv. 283*. V. jamaicense *Macf. Jam. ii. 195 (1850)*.

St. Andrew, McNab! Oersted. — Porto Rico, Antigua, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Barbados, Trinidad, Costa Rica.

Leaves 2-6 cm. l., 1-3.5 cm. br., apex rounded or emarginate, sessile but attenuated into a petiole-like base, 3-5-nerved from the base. Spikes generally 3-, more rarely 4-jointed. Berries transparent orange-yellow, 3.5-6 mm. l., crowned with the corolla, which is almost always open.

Var. *domingense* comb. nov.; branches not so distinctly 4-angled, here and there 2-angled, generally terete below; spikes always unisexual, each joint of the female bearing generally two flowers, rarely 3-4, the male (very rarely observed) having up to 6 in each joint; berries (rather young) narrowly oval.—P. *trinervium* Griseb. var. *domingense* Kr. & Urb. in *Engl. Bot. Jahrb. xxiv. 38 (1897)*. *Loranthus domingensis* Desv. in *Ham. Prodr. 33 (1825)*; *DC. Prodr. iv. 293*. *Phthirusa domingensis* Eichl. in *Fl. Bras. v. pt. 2, 134<sup>i</sup> (1868)*. *Dendropemon domingensis* v. *Tiegh. in Bull. Soc. Bot. France, xlvi. 170 (1895)*.

Shakspear! in woods everywhere, Broughton! Wareka Road, Campbell! Mona woodland, 800 ft.; near Wareka, 400 ft.; Hope; near Letitz, 500 ft.; Wareka Road, 200 ft.; sea-coast near Bull Bay; Great Goat Island; Harris! near Angel's Pen, Harris & Britton! Fl. Jam. 6383, 6399, 6552, 6604 (in part), 6605, 6676, 6781, 7264, 8138, 9568, 10,175, 10,529. Growing on *Croton linearis*, *Fandia aculeata*, *Annona squamosa*, *Erythroxylum areolatum*, *Casearia* and *Bauhinia divaricata*.

4. P. *Fici* Urb. *Symb. Ant. v. 333 (1907)*; diœcious (female only seen), branches terete, becoming subquadrangular above; scale-sheaths 1 or 2, rarely 3, sometimes as much as 5 mm. above base; leaves on the same branch very variable, oval-elliptical, narrowly obovate, oblong-lanceolate or lanceolate; spikes (female only seen) 1.2-2.5 cm. l., increasing to 4 or 5 cm. in the fruit, 3- or 4-jointed (rarely 2); flowers in 4 rows in the joints (with 2 odd in the joint next the lowest), making 6 or 8 flowers, generally fewer in the lowest and highest, more often 2; berries smooth.

Great Goat Island, 50 ft., Harris! Fl. Jam. 9220. Growing on *Ficus*.

Branches to 30 cm. l., glabrous; internodes 1.5-3 cm. l. Leaves 9-5 cm. l., 3.5-1.3 cm. br., narrowed above, obtuse, below narrowed into a petiole-like base, 3-nerved. Berries shortly ovoid, 3.5-4 mm. l., greenish-yellow, with corolla open.

4A. P. *albovaginatum* Urb. *Symb. Ant. vii. 504 (1913)\**; diœcious (?); branches terete, the uppermost internodes 2-angled

\* The description of this species was published after the previous sheet was sent to press, and therefore too late for inclusion in the Key.

but not dilated near the apex; scale-sheaths solitary, white; leaves ovate-elliptical to oblong-lanceolate; spikes (female only seen) about 2 cm. l., 3-4-jointed; flowers in 4 rows in the joints (with 2 odd ones added), in each joint 6-13, fewer in the highest and lowest.

Near Ewarton, *Harris*; Fl. Jam. 6703.

Plant about 2½ ft. high, yellowish-green when alive. Branches yellowish-olive when dry, internodes 3·5-5·5 cm. l. Leaves 5-3·5 cm. l., 2·5-1·5 cm. br., apex obtuse or rounded, below narrowed; 3-nerved at base, but the lateral soon disappearing. Berries (immature) globose, golden-yellow, crowned by the closed corolla.

5. *P. crenulatum* *Urb.* *Symb. Ant.* v. 332 (1907); monoecious, branches terete, becoming sometimes 2-angled above; scale-sheaths solitary (rarely 2) at the base, or even 4 mm. above the base of branches; leaves obliquely obovate-elliptical or obliquely elliptical or elliptical-oblong; spikes 1·5-2·5 cm. l., 5-(4-6-) jointed; flowers in 4 rows (with 2 odd at top of each internode), 10-14 in each joint, fewer in the highest.

Near Halberstadt, 2900 ft., *Harris*! Fl. Jam. 6659. Growing on *Cordia gerascanthoides*.

Plant 4 ft. high, much branched. Branches glabrous, internodes 2-5 cm. l. Leaves 5-7 cm. l., 1·5-2·5 cm. br., apex rounded, somewhat abruptly attenuated into a short petiole-like base, margin more or less crenulate, 3-5-nerved. Spikes androgynous. Flowers of each joint, the upper few or several female, the lower several or few male.

6. *P. Wattii* *Kr.* & *Urb.* in *Engl. Bot. Jahrb.* xxiv. 43 (1897); dioecious; branches elongate, terete, younger more or less compressed, and towards the nodes more or less dilated; leaves narrowly oblong-elliptical or oblong-lanceolate, slightly oblique; spikes 1-2 cm. l., 3-4- (rarely 5-) jointed; flowers in the male joints in 4 rows (with 2 odd at top of internode), in each joint 10-14, in the female joints in 2 rows, in each joint 2; berries smooth.—*Viscum flavens* *Macf. Jam.* ii. 195 (1850) (non *Swartz*). (Fig. 29.)

*Shakspear*! *Macfadyen*! *Watt*! Wareka Road; Palisadoes; *Campbell*! Silver Hill, 3500 ft.; Petersfield, 2500 ft.; sea-coast, Ferry Pen; Old England, 3500 ft.; near Wareka, 400 ft.; Charlemont, near Ewarton, 1000 ft.; coast between Portland Point and Rocky Point; *Harris*! Salt Island, *Harris* & *Britton*! Fl. Jam. 6221, 6385, 6386, 6395, 6401, 6402, 6538, 6599, 6680, 6711, 10,188, 10,519. Growing on *Coccobla diversifolia*, *Hypelate trifoliata*, *Piscidia Erythrina*, *Colubrina*, *Phoradendron baccatum* and *Laguncularia*.

Plant pendulous, sometimes as long as 2·5 m.; internodes 1·5-5 cm. l. Leaves 4-7·5 cm. l., 1-2·5 cm. br., apex obtuse, narrowed somewhat abruptly into a petiole-like base, 3-5-nerved. Berries ovoid, 5-7 mm. l.

7. *P. Campbellii* *Kr.* & *Urb.* in *Engl. Bot. Jahrb.* xxiv. 44 (1897); older branches terete, more or less evidently 4-lined,

the younger 4-angled-compressed; scale-sheaths solitary (rarely wanting); leaves oblong-lanceolate or lanceolate, narrowed above or acuminate; spikes (when fruiting) 1 cm. l., 3-jointed, dioecious(?) (female only seen); flowers in 2 rows, in each joint 2.

Wareka Road, Campbell! Fl. Jam. 6398 (in part), 6604 (in part). Growing on *Pisonia obtusata*.

Branches long, glabrous; internodes 2-4 cm. l. Leaves 5-7 cm. l., 1.5-2(-3) cm. br., attenuated into a petiole-like base (2-4 mm. l.), subpenninerved, 2 lateral nerves from the base, and 2 from the median nerve about 1 cm. above the base. Spikes 1 or 2 in the axils; peduncle 2-3 mm. l.; joints 3-4 mm. l. Berries (immature) shortly ovoid, 2.5 mm. l., with petals generally somewhat open.

8. P. *Grisebachianum* *Eichl.* in *Fl. Bras. v. pt. 2*, 134<sup>n</sup> (1868); plant dioecious; branches terete below, becoming 4-angled towards apex, compressed; scale-sheaths 1 or 2 only on the lowest internode of the branches, one above the base, the other to 1 cm. higher; leaves ovate to oblong-lanceolate, sometimes asymmetrical; spikes at length 1-2 cm. l., 3-4-jointed; flowers in 6 rows, in the male joints 20-26, in the female median joints 4-7, fewer in the lowest and highest.—*Kr. & Urb.* in *Engl. Bot. Jahrb. xxiv.* 45. *P. Berterianum* *Griseb.* *Fl. Br. W. Ind.* 313 (1860) (in part).

*Prior!* Second Breakfast Spring, Tweedside, 2700 ft.; Brumalia, near Mandeville, 2200 ft.; Chester Vale, 3000 ft.; Kentucky Hill, Bluefields Mt., 2000-2500 ft.; Peckham woodland, Upper Clarendon, 2500-2800 ft.; *Harris!* Fl. Jam. 6341, 6376, 6397(a), 10,202, 10,861; Union Hill, near Moneague, *Britton & Hollick*, 2772! Growing on *Nectandra antillana* and *Coccoloba*.

Plant 3 ft. high; branches glabrous, internodes 2-5 cm. l. Leaves 5-11 cm. l., 2-5 cm. br.; apex obtuse, attenuated at base into the petiole, penninerved. Berries globose, 3 mm. in diam., with the corolla closed.

## § 2. Scale-sheaths on all the internodes.

9. P. *latifolium* *Griseb.* *Fl. Br. W. Ind.* 314 (1860); variable, branches long, terete, the younger more or less compressed below the nodes; leaves penninerved, ovate to elliptical-oblong, sometimes asymmetrical, spikes at length 3-7 cm. l., 4-8-jointed; flowers in 4 rows (with 2 odd at top of joints), 6-22 in each joint, the highest 2 or few male in the androgynous joints, the rest female.—*Eichl.* in *Fl. Bras. v. pt. 2*, 126, t. 41; *Urb.* in *Engl. Bot. Jahrb. xxiv.* 49 & *Symb. Ant. iv.* 209. *Viscum latifolium* *Sw.* *Fl. Ind. Occ.* 268 (1797). *V. tereticaule* *DC. Prodr. iv.* 280 (1830).

*Swartz*; *Purdie!* *Wilson!* *Prior!*—Fray woods, 1650-1800 ft.; *Harris!* Fl. Jam. 10,339. Growing on *Eugenia*.—Cuba, Porto Rico, Dominica, Martinique, St. Vincent, Grenada, Trinidad, continental tropical America.

Leaves 5-10 cm. l., 2-5 cm. br., generally more or less acuminate, base narrowed into the short petiole, nerves generally scarcely evident. Spikes orange-yellow, 1 or several in the axils of the leaves and at the base of the branches. Berries yellow or orange-yellow, ovate, 3-4.5 mm. l.

10. *P. flavens* Griseb. *Fl. Br. W. Ind.* 313 (1860); branches long, terete; scale-sheaths 2 on the lowest internode, one above the base, another about the middle, solitary on the other internodes, 7–15 mm. above the base; leaves 5–(7)-nerved, ovate or oval-elliptical or elliptical-oblong; spikes at length 3–5 cm. l., 5–6-jointed; flowers in 6 rows, 24–32 in each joint, the highest male, the rest female.—*Urb. in Engl. Bot. Jahrb. xxiv.* 50. *Viscum flavens* Sw. *Prodr.* 32 (1788) & *Fl. Ind. Occ.* 266 (excl. syn. *Plum. & Aubl.*); *DC. Prodr.* iv. 282 (in part). *V. macrophyllum* Macf. *Jam. ii.* 195 (1850) (non *Spreng.*). Type in Herb. Stockholm.

*Swartz*; *Macfadyen!* Westmoreland; Manchester; *Purdie!* Morse's Gap, 5000 ft.; *Harris!* St. George, *Watt!* Fl. Jam. 6203, 6219. Growing on *Guarea trichilioides*.—Dominica, St. Vincent, Grenada, Trinidad, tropical America.

Leaves 6–15 cm. l., 2–7 cm. br., shortly acuminate, narrowed into a petiole-like base. Spikes 1 or several in the axils. Berries white or yellow, ovoid.

### 5. DENDROPHTHORA Eichl.

Shrubs; branches articulated at the nodes. Leaves (in the Jamaican species) reduced to minute scales, or wanting. Spikes axillary or terminal, articulated, with 2 minute bracts at each joint. Flowers solitary or several on each side of a joint, usually superposed in 2 rows (4 sometimes), diœcious or monococious, more or less immersed in the rhachis. Male flower: petals 3, united at base; anthers sessile, opposite the petals, transverse, cells confluent dehiscing by a single chink. Female flower: petals 3; ovary inferior. Berry crowned by the minute petals. Seed with a small embryo enclosed in copious endosperm.

Species about 42, natives of West Indies and tropical America.

Diœcious; internodes more or less compressed.

Plant light green; internodes flattened, phyllode-like 1. *D. monstrosa*.

Plant dark green; internodes more or less flattened,

inferior often terete ..... 2. *D. opuntioides*.

Monococious; all the internodes terete ..... 3. *D. cyprioides*.

1. *D. monstrosa* nom. nov.; diœcious; all the internodes flattened, phyllode-like, oblong-linear with rounded apex, sometimes becoming cuneate, 5–2 cm. l. to 2 cm. br.; male flowers 10–24 in each joint in 2–8 rows; female flowers in 2 rows, 2–6 in each joint.—*D. opuntioides* Eichl. in *Fl. Bras.* v. pt. 2, 102 (1868); *Urb. in Engl. Bot. Jahrb. xxiv.* 55 (1897); *York in J. Hopk. Univ. Circ.* (reprint) 39 (1912); (non L.). *Viscum opuntioides* DC. *Prodr.* iv. 284 (1830). *V. monstrosum* Bert. *MS. in DC. loc. cit.* (nom. ined.). *Arceuthobium opuntioides* Griseb. *Fl. Br. W. Ind.* 315 (1860).

Broughton! Shakspear! Masson! St. Elizabeth, McNab! Bertero; Wullschlaegel; Moneague, Prior! J.P. 1165, Morris! Cinchona, Watt! Fawcett! Tweedside, Mt. Moses; Strawberry Hill; Troy, 1600 ft.; Harris! Fl. Jam. 6217, 6338, 6355, 6477, 9436; Cinchona, G. Nichols! between Moneague and Mt. Diabolo, Britton, 2714! Growing on *Rhytidophyllum tomentosum*, *Oreopanax capitatum* and *Byrsonima*.—Hispaniola.

The typical forms of this and the next species are quite distinct, but narrow-jointed forms of *D. monstrosa* nearly approach the broader-jointed forms of *D. opuntioides*, which might perhaps be regarded merely as a variety of the former. Linnaeus based his *Viscum opuntioides* on a reference to Sloane (Hist. ii. 93, t. 201, f. 1), which is undoubtedly Grisebach's *Arceuthobium gracile*, and not the broader-jointed form generally known as *D. opuntioides*.

2. *D. opuntioides* nob. (non Eichl.): dioecious; the internodes more or less flattened or the inferior terete, 3–1 cm. l. to 3 or 4 mm. br.; male flowers forming a single or double row on each edge of the spike, 8–20 in each joint; female flowers in 2 rows, 2 or 4 in each joint; when two, inserted under apex of joint.—*D. gracilis* Eichl. tom. cit. 103 (1868); *Urb. tom. cit.* 56; *York loc. cit.* D. Danceri Kr. & *Urb. in Ber. Deutsch. Bot. Ges. xiv.* 284 (1896). *Viscum opuntioides* ramulis compressis Sloane Cat. 168, *Hist. ii.* 93, *t.* 201, *f.* 1. *Viscum opuntioides* L. *Sp. Pl.* 1023 (1753); *Wright Mem.* 303; *Macf. Jav. ii.* 196. *V. gracile* DC. *tom. cit.* 285 (1830). *Razoumofskya jamaicensis* Hoffm. *Hort. Mosq.* (1808). *Arceuthobium gracile* Griseb. *loc. cit.* (1860). (Pl. 4.) Type in *Herb. Mus. Brit.*

Banks of Hope River, Sloane Herb. vi. 109! Dancer; Bertero; Macfadyen! Port Royal Mts., Purdie! Catherine Peak, 5000 ft., Eggers! Morse's Gap, 5000 ft., Plaxton! Blue Mt. Ridge, Fawcett! Cinchona; Portland Gap, 5400 ft.; Greenwich woodland; Harris! Fl. Jam. 6202, 6206, 6215, 6216, 10,139; below Blue Mt. Peak, 6000 ft., G. Nichols! Cinchona, Shreve! Growing on *Cyrilla antillana*, *Baccharis scoparia* and *Heterotrichum patens*. Urban distinguishes *D. Danceri* by its having the female flowers in the middle of the joint instead of near the apex. We have not seen Dancer's specimen, but we are unable to distinguish from *D. gracilis* the male specimens (Fl. Jam. 6200, 6343), assigned to *D. Danceri* by Urban.

3. *D. cupressoides* Eichl. in *Fl. Bras. v. pt. 2*, 103 (1868) (in part): all the internodes terete, scales decussate.—*Oliv. in Hook. Ic. Pl. xxiii. t. 2221*; *Urb. tom. cit.* 59. *Viscum cupressoides* Macf. *Jam. ii.* 197 (1850). *Arceuthobium cupressoides* Griseb. *Fl. Br. W. Ind.* 315 (1860).

Macfadyen! Cinchona, 5000 ft., Morris! Fawcett! Harris! G. Nichols! Fl. Jam. 6204, 6205, 6214, 6388. Growing on *Miconia quadrangularis*.—Cuba, Hispaniola.

Monœcious, 1·5–2(–3) dm. l. Internodes 5–1 cm. l. Spikes 6–1·5 cm. l., 3–5-jointed, often proliferous; joints 2–3 mm. l. Flowers, in each joint 2, generally decussating with the pair at the next joint, most female, a few male here and there on a joint.

## 6. EUBRACHION Hook. f.

Shrub, much branched. Leaves reduced to peltate scales, spirally arranged. Spikes crowded in a kind of raceme at the ends of branchlets. Bracts scale-like, roundish-ovate, the lowest empty, persistent, the intermediate with their male flowers deciduous, the upper enclosing female flowers persistent. Flowers sessile in the axils of bracts, monoecious in the same spike, parts of the flowers in threes. Male flowers: petals 3, springing from a short, top-shaped receptacle; stamens 3; pistil rudimentary,



Fig. 30.—*Eubrachion ambiguum* Engl. var. *jamaicense* Kr. & Urb.

A, Portion of plant in flower.	G, Germinating seed.
B, Flower-spike.	H, Germinating seed attached
C, Male flower.	to twig by its viscous
D, Stamen.	covering.
E, Fruit.	e, endosperm; c, embryo;
F, Fruit cut lengthwise.	v, viscous mass.

forming a flat 3-lobed disk, the lobes alternate with the petals. Female flowers: stamens wanting; ovary broadly ovoid, disk as in male flowers; style from middle of disk very short, with obtuse stigma. Berry ovoid-subglobose, crowned with the persistent petals; pericarp fleshy with a thick viscous layer above the seed; seed depressed-globular; embryo cylindrical in the median line of tough endosperm.

Species 1, in Jamaica, Brazil, Uruguay and Argentina.

*E. ambiguum* Engl. var. *jamaicense* Kr. & Urb. in Engl. Bot. Jahrb. xxiv. 31 (1897). (Fig. 30.)

Swartz! near Cinchona, 5000 ft., J.P. 663, Hart! Fawcett! Newhaven Gap, 5400 ft., Harris! Fl. Jam. 6220, 6389, 9377, 10,025. Growing on *Calypranthes*, *Eugenia fragrans* and *E. biflora*.

Shrub 2-4 dm. high. Scales persistent, 2 mm. l. with a circular area just below the middle, 1 mm. l. & br. Spikes generally crowded at apex of branches, 3-7 mm. l. Bracts 1.2-1.4 mm. l. Petals, male 8-1 mm. l.; female 5-6 mm. l.

## FAMILY XII. BALANOPHORACEÆ.

Fleshy herbs, parasitic on roots, generally of trees, without chlorophyll. Rhizomes tuberous, giving rise to peduncles covered with scales and enlarged above to form spadices, which are sometimes covered with deciduous bracts. Flowers unisexual, very densely crowded on unisexual or androgynous spadices, small, or the female especially minute and forming a continuous layer, mixed often with densely crowded jointed hairs; the male generally much larger. Male flowers usually with a 3-8-lobed perianth of which the lobes are valvate. Stamens opposite to perianth-lobes; filaments free or connate. Anthers free or connate, 2-celled, or each cell again divided into two or many cells, each cell dehiscing by pores or chinks, or irregularly ruptured; pollen globose-trigonal. Female flower: perianth none, or 2-lipped or tubular, epigynous. Ovary 1-3-celled; styles terminal. Ovules solitary in the cells, pendulous, usually without integument. Fruit of same shape as ovary but a little larger, a 1-celled, 1-seeded nut. Seed with endosperm; embryo microscopic.

Species about 40, occurring generally in damp primeval forests of mountainous places in the tropics, a few South African, one Mediterranean, another in New Zealand.

### SCYBALIUM Schott & Endl.

Fungus-like fleshy blood-red-coloured plants parasitic on roots of dicotyledonous trees. Rhizome tuberous. Peduncles, covered with imbricated scales, enlarged above, forming spadices covered with subpeltate bracts, which are at first imbricate, soon deciduous. Spadices unisexual or androgynous. Receptacle covered with a compact layer of club-shaped scales among which are the flowers. Flowers monœcious or diœcious. Male flowers: tube of the perianth cylindrical, lobes 3, ovate, concave. Stamens 3, filaments connate into a tube with apices free; anthers opposite to the lobes of the perianth, connate, each of the two cells divided into 2 or 4, dehiscing by rupture at the apices. Female flowers: perianth wanting. Ovary 2-celled; styles 2, long, filiform, deciduous, stigmas capitellate; ovules 2, pendulous from the apex of the central placenta, anatropous.

Fruit a 1-celled, 1-seeded nut. Seed oblong, with oily endosperm; embryo very minute, apical.

Species 4, natives of the West Indies, Brazil and Colombia.

*S. jamaicense* Schott & Endl. *Melet.* 12 (1832); *Eichl.* in *DC. Prodr.* xvii. 133; *Urb. Symb. Ant.* iv. 210. *Cynomorium erectum* &c. *Browne Hist. Jam.* 334. *Cynomorium jamaicense* Sw. *Prodr.* 12 (1788) & *Fl. Ind. Occ.* 11; *Wright Mem.* 297. *C. coccineum* *Descourt. Fl. Ant.* ii. t. 96 (1821-29) (non L.). *Phyllocoryne jamaicensis* *Hook. f.* in *Trans. Linn. Soc.* xxii. 51, t. 11 (1856); *Griseb. Fl. Br. W. Ind.* 309. (Pl. 5.)

In woods on the mountains of the interior during April and May; *Wright!* *Browne*; *Swartz*; *St. Mary, McNab!* *Portland*; *Westmoreland*; *Purdie!* *Wilson*; *Wullschlaegel*; *Prior!* *Harris!*—*Cuba, Hispaniola, Porto Rico.*

Rhizome long, cylindrical. Spadices 4-23 cm. l., unisexual, cylindrical or subclavate; peduncle 1.5-18 cm. l. Scales greyish-brown, ovate or broadly triangular, acuminate, the lower smaller, about 5 mm. l., passing into the bracts (15-25 mm. l.). Capitulum blood-red-coloured, 2-6 cm. l. Male flowers 5 mm. l., purple; female (incl. styles) about 2.5 mm. l. Fruit 2 mm. l.

### FAMILY XIII. ARISTOLOCHIACEÆ.

Herbaceous or shrubby, sometimes twining (in West Indian species). Leaves alternate. Flowers hermaphrodite. Perianth simple, superior, coloured. Stamens generally 6, sometimes more, forming a column with the style (gynostemium); anthers adnate to the column, the cells dehiscing outwardly. Ovary inferior, 6-celled (imperfectly or perfectly), the placentas projecting from the walls into the centre of the ovary and sometimes uniting. Style with 3 or 6 stigmatic lobes. Ovules numerous, anatropous, horizontal or pendulous. Capsule 6-valved. Embryo small, enclosed in the abundant fleshy endosperm.

Species about 200, widely dispersed through the temperate and warmer regions of the whole world.

#### ARISTOLOCHIA L.

Leaves entire or lobed. Peduncles axillary, 1-flowered, generally solitary. Bract none, or simulating a stipule. Perianth irregular, superior, utricle round gynostemium, constricted and tubular above, ending in a two-lipped or entire limb, which is sometimes tailed.

Leaves 3-lobed ..... 1. *A. trilobata*.  
Leaves not 3-lobed.

Perianth-limb 2-lipped ..... 2. *A. ringens*.  
Perianth-limb not 2-lipped.

Perianth-limb with a long tail ..... 3. *A. grandiflora*.  
Perianth-limb not tailed.

Perianth-limb cordate-oblong, mucronate 4. *A. odoratissima*.  
Perianth-limb cordate-deltoid, obtuse .... 5. *A. elegans*.

1. *A. trilobata* L. *Sp. Pl.* 960 (1753); leaves trilobed, rarely subentire; perianth with one lip, lip ending in a tail 2 or 3 times longer than the whole perianth.—*Jacq. Eclogæ Pl. Rar.* i. 43, t. 26; *Wright Mem.* 189; *Griseb. Fl. Br. W. Ind.* 299; *Duchartre in DC. Prodr.* xv. pt. 1, 444; *Urb. Symb. Ant.* iv. 210. *A. scandens* foliis sublobatis &c. *Browne Hist. Jam.* 829. (Fig. 31, A, B.)

Contrajerva of the north side (Browne).

*Wright!* *Distin!* *Bowdler!* St. Thomas in the Vale, *Waterton!* *McNab!* *Wilson!* Balaclava, *Key!*—West Indies, tropical continental America.

Plant with a heavy smell. Leaves 6-13 cm. in diam. Bract roundish-elliptical. Perianth, inflated base 3-5 cm. l., upper tubular portion, 3·5-6 cm. l., lip cordate, about 2 cm. in diam., tail 1·2-3 dm. l. Capsule 7-8 cm. l., about 2 cm. br.

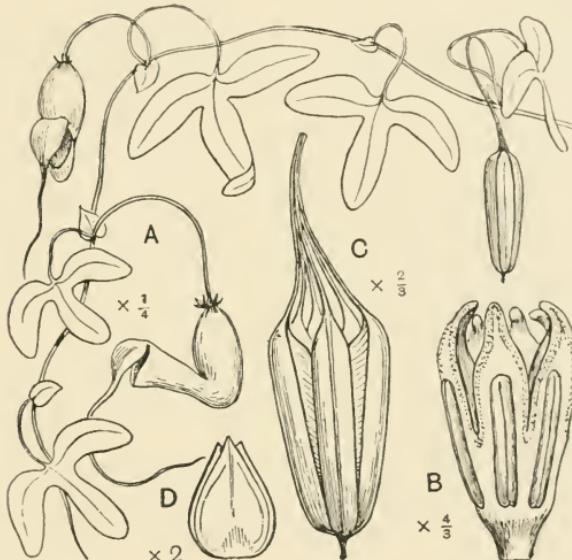


Fig. 31.—*Aristolochia*.

A, Leafy shoot with flowers and young fruit. C, Fruit dehiscing.  
B, Gynostemium. D, Seed.  
A, B, *A. trilobata* L., C, D, *A. elegans* Mast.

2. *A. ringens* Vahl *Symb. Bot.* iii. 99; leaves kidney-shaped; perianth with 2 lips, the upper lip about double as long as the lower, lanceolate, obtuse, the lower spatulate.—*Jacq. Collect. v. t. 4* (fruit and seed); *Griseb. loc. cit.*; *Duchartre tom. cit.* 471. *A. grandiflora* Vahl *op. cit. ii.* 94, t. 47 (non *Sw.*). Type in *Herb. Mus. Brit.*

*Von Rohr!* *Purdie!* *Morant Bay, Harris!*—Cuba, Venezuela, Colombia.

Leaves 8-12 cm. in diam. Bract subscarious, reniform. Perianth, inflated base 3-5 cm. l., upper tubular portion 2·5-3 cm. l., upper lip 8-14 cm. l., lower 5·5-6·5 cm. l. Capsule 8 cm. l., 3 cm. br.

3. *A. grandiflora* Sw. *Prodr.* 126 (1788); leaves cordate, roundish-ovate, acute; flowers very large; limb above the mouth ample, cordate-ovate-roundish, ending in a tail generally longer than the limb.—*Sw. Fl. Ind. Occ.* 1566; *Tussac Fl. Ant. t. 27*; *Descourt. Fl. Ant. iii. t. 157*; *Hook. Bot. Mag. tt. 4368, 4369*; *Griseb. loc. cit.* (excl. syn.); *Duchartre tom. cit. 472*; *Urb. Symb. Ant. iv. 211* (non *Vahl*). *A. scandens* foliis amplioribus &c. *Browne Hist. Jam.* 329. *A. gigas* *Lindl. Bot. Reg.* 1842, t. 60.

Poisoned Hog-Meat.

*Wright*! north side, *Broughton*! *Distin*! *St. Mary*, *McNab*! *Sedburgh*, *Manchester*, *Purdie*! *Prior*! *March*! *Morce*! *Fort Stewart*, *Metcalfe*! near *Orange Bay*, *Thomas*! near *Castleton*, *Harris*! cult. in *Hope Gardens*, *Fl. Jam.* 8438.—*Trinidad*, *Panama*, *Ruatan Is.*, *Bay of Honduras*, *Guatemala*.

*Plant*, with a fetid smell, poisonous. *Leaves* 8-12 cm. in diam. *Bract* perfoliate, roundish-elliptical or ovate, sometimes cordate. *Flowers* variegated-purple, variable in size. *Perianth*, inflated base 6-9 cm. l., limb 1-2 dm. l. *Capsule* 10 cm. l., 4 cm. br.

4. *A. odoratissima* L. *Sp. Pl. ed. 2*, 1362 (1762); leaves cordate, ovate or kidney-shaped, obtuse or subacuminate; perianth, limb above the mouth cordate-oblong, mucronate, base broadly inflated.—*Descourt. Fl. Ant. v. t. 356*; *Wright Mem.* 189; *Duchartre tom. cit. 474*. *A. scandens* &c. *Sloane Cat.* 60 & *Hist. i. 162*, t. 104, f. 1. *A. scandens* foliis cordato-acuminatis &c. *Browne Hist. Jam.* 329. Type in *Herb. Mus. Brit.*

Contrajerva of the south side (Browne).

*St. Jago de la Vega*, *Sloane Herb.* iii. 32! *Wright*! *Broughton*! *Shakspear*! *Swartz*! *Macfadyen*! *Distin*! *Purdie*! *McNab*! *Heward*! *March*! *Shearer*! *Hope*, 700 ft.; *Stony Hill*; *Harris*! *Fl. Jam.* 6655, 8450.—*W. Indies*, *Central America*, *Paraguay*.

The whole plant has a pleasant smell. *Leaves* very variable, 6-14 cm. l., 4-8.5 cm. br. *Bract* broadly elliptical, cordate. *Perianth*, inflated base 1.5-2 cm. l., about 1 cm. br., upper tubular portion 8-1.5 cm. l., limb 5.5-7.5 cm. l. *Capsule* 6-7 cm. l.

5. *A. elegans* *Mast. in Gard. Chron.* 1885, pt. 2, 301, fig. 64; leaves triangular-cordate, obtuse; perianth, limb above the mouth cordate-deltoid, obtuse, base not much inflated. (Fig. 31, C, D.)

*Troy*, 2200 ft., *Harris*! *Fl. Jam.* 10,655.—*Brazil*.

*Leaves* 4-7 cm. l., 4-9 cm. br. *Bract* roundish, cordate. *Perianth*, inflated base 2.5-3 cm. l., about 1 cm. br., upper tubular portion 1.5-2 cm. l., limb 6-7 cm. l. *Capsule* 4-6 cm. l.

FAMILY XIV. POLYGONACEÆ.

Herbs, shrubs or trees. Leaves alternate or, more rarely, opposite, with petiole generally more or less dilated, amplexicaul at the base, and then often with a membranous margin continuous with the tubular stipule (ochrea) which sheathes the stem; a ring-like scar is often left at the fall of the leaf. Flowers

generally small, solitary or generally clustered within a bract. Pedicels jointed. Flowers hermaphrodite or unisexual, regular. Perianth inferior, green or coloured, lobes or segments 4–6, in 2 whorls or spiral, imbricate, after flowering unchanged, or the whole or one whorl attached to, and growing with, the fruit. Stamens 6–9; filaments free or connate at the base. Ovary superior, 1-celled. Styles 2 or 3 with expanded stigmas. Ovule single, orthotropous. Fruit a nut, 3-angled or bi-convex, enclosed by the perianth. Seed erect; endosperm filling the seed, sometimes ruminate. Embryo more or less excentric; cotyledons somewhat flat.

Herbs.

Perianth-segments 6 in two series ..... 1. *Rumex*.

Perianth-segments 5 ..... 2. *Polygonum*.

Trees or shrubs. Perianth-segments 5.

Ochreae large ..... 3. *Coccoloba*.

[Ochreae obsolete. Inflorescence with tendrils ..... *Antigonon*.]

## 1. RUMEX L.

Perennial herbs. Leaves alternate, sometimes radical. Flowers in clusters which are paniculate in W. Indian species, hermaphrodite or unisexual by abortion, sometimes dioecious. Perianth-segments 6 in two series, the outer unchanged after flowering, the inner “valves” attached to, and growing with, the nut, or remaining unchanged. Stamens 6. Ovary 3-angled; styles 3, expanded into variously cut stigmas. Nut with prominent angles. Embryo lateral, cotyledons linear or oblong.

Species about 140, very widely dispersed through the temperate regions of the northern hemisphere, fewer in the tropics and the southern hemisphere.

Leaves entire. Flowers hermaphrodite.

Valves entire ..... 1. *R. crispus*.

Valves with long subulate teeth ..... 2. *R. obtusifolius*.

Lower leaves hastate. Flowers dioecious ..... 3. *R. Acetosella*.

1. ***R. crispus* L. Sp. Pl. 335 (1753);** leaves elongate-oblong, margin of the larger leaves undulate-crispate, attenuated both at base and apex; whorls of flowers numerous, crowded in fruit in a long narrow panicle, leafy below; flowers hermaphrodite; valves broadly ovate, subcordate, obtuse, with raised reticulation, entire, sometimes obsoletely denticulate at the base, the median nerve swollen into an oval callus.—*Meisn. in DC. Prodr. xiv. 44*; *Lindau in Urb. Symb. Ant. i. 210, iv. 211.*

Port Royal, McNab! near Gordon Town, Ball! Hardware Gap, 4000 ft., Harris! Fl. Jam. 10,113.—Bermuda, Cuba, Hispaniola, Porto Rico, Guadeloupe. Widely distributed in the north temperate regions of the Old World, perhaps an introduction in the New World.

Stem 1–3 ft. Leaves 1·5–2·5 dm. l. Valves 3–5 mm. l.

2. *R. obtusifolius* L. *Sp. Pl.* 335 (1753); leaves ovate-oblong, becoming lanceolate above, obtuse to acute, base cordate to rounded or obtuse; whorls of flowers distant in fruit in a long, narrow panicle, leafy below; flowers hermaphrodite; valves triangular, with raised reticulation, base with 3 linear-subulate teeth on each side, median nerve with or without a callus.—*Meisn. tom. cit. 53*; *Lindau loc. cit.* (Fig. 32.)

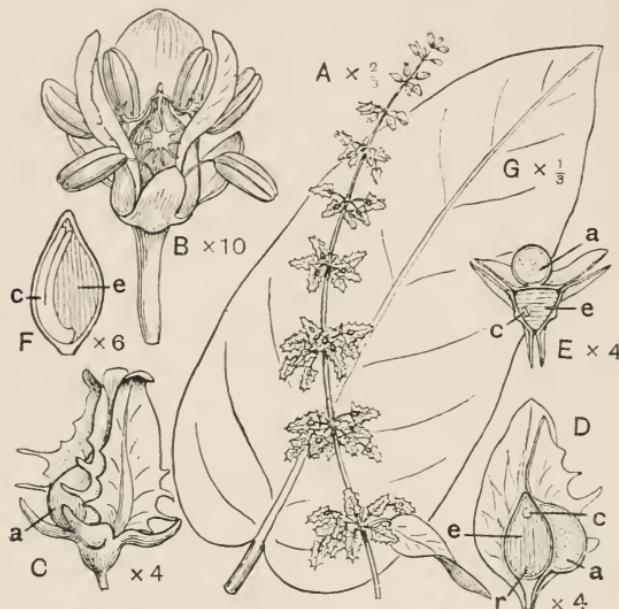


Fig. 32.—*Rumex obtusifolius* L.

A, Portion of panicle in fruit.

B, Flower.

C, Persistent perianth enclosing fruit.

D, Fruit with persistent perianth cut lengthwise.

E, Do, cut transversely.

F, Fruit cut lengthwise at right angles to D.

G, Leaf.

a, callus; c, cotyledons; e, endosperm; r, radicle.

Base of Catherine's Peak, 4500 ft., *Harris!* Fl. Jam. 7660.—Cuba. Widely distributed in the north temperate regions of the Old World, perhaps an introduction in the New World.

*Stem* 2–3 ft. *Leaves* 1·5–3 dm. l. *Valves* about 5 mm. l.

3. *R. Acetosella* L. *Sp. Pl.* 338 (1753); leaves oblong to linear or lanceolate (in the Jamaican specimen oblong-elliptical), hastate; panicle leafless; flowers dioecious; valves herbaceous, unchanged in fruit, ovate, without callus.—*Meisn. tom. cit. 63*.

In damp places along roadside, Hardware Gap, 4000 ft. (without flowers), *Harris!* Fl. Jam. 10,114.—North temperate and arctic zones; introduced in the south.

*Stem* very variable in height, low-growing to 5 dm. *Leaves* 1·5 to 5 cm. l.

## 2. POLYGONUM L.

Herbs, sometimes shrubby at base. Leaves alternate. Flowers clustered on spike-like racemes, sometimes panicled [or capitate in corymbs]. Perianth deeply 5-lobed, coloured. Stamens 8-6, inserted on the perianth. Styles 2 or 3 united below; stigmas capitate entire. Nut small. Embryo excentric in endosperm; cotyledons narrow.

Species about 150, widely dispersed through the whole world.

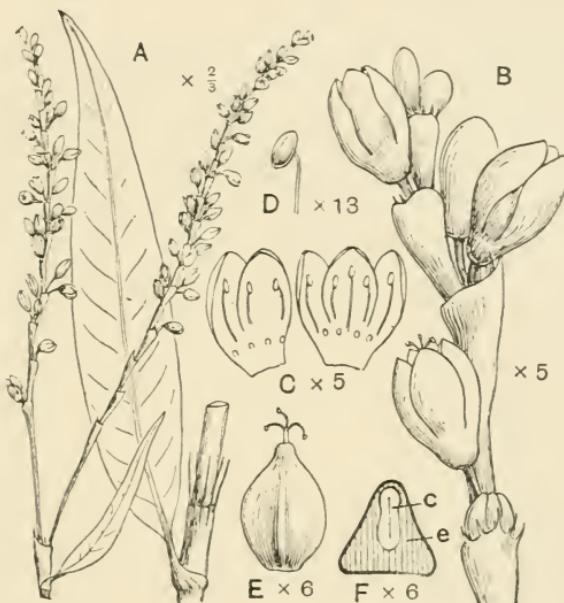


Fig. 33.—*Polygonum punctatum* Ell.

A, Leaf and flower-spikes.

E, Nut.

B, Portion of flower-spike.

F, Do. in transverse section; e, endo-  
sperm; c, embryo.

C, Perianth cut open.

D, Stamen.

§ 1. Flower-clusters in spike-like racemes.

Stipules setose-ciliate.

Glandular-punctate on calyx and stipules.

Stipules puberulous ..... 1. *P. punctatum*.

Not glandular. Stipules hispid ..... 2. *P. acuminatum*.

Stipules not setose-ciliate.

Glandular-hispidulous on young branches and  
peduncles. Leaves linear or linear-lanceo-  
late ..... 3. *P. mexicanum*.

Glabrous. Leaves lanceolate ..... 4. *P. glabrum*.

[§ 2. Flowers capitate in corymbs ..... *P. chinense*.]

## § 1. Flower-clusters in spike-like racemes.

1. *P. punctatum* *Ell.* *Sketch i.* 455 (before Nov. 1817): punctate with sessile glands; stipules sparsely puberulous, ciliate with long slender bristles.—*Small in Mem. Columb. Coll. i.* 88, *t. 31* (1895). *P. acre* *Kunth* *in H. B. & K. Nov. Gen. & Sp. ii.* 179 (Dec. 1817); *Meisn. in DC. Prodr. xiv.* 107; *Griseb. Fl. Br. W. Ind.* 161; *Lindau in Urb. Symb. Ant. i.* 212 (excl. *P. Persicaria Lun.*); *Urb. Symb. Ant. iv.* 211. *Persicaria procumbens* &c. *Sloane Cat.* 48 & *Hist. i.* 17, *t. 3, f. 1.* (Fig. 33.)

Banks of Rio Cobre, *Sloane* *Herb. ii.* 105! Fort Stewart, *Metcalfe*! Ferry, Spanish Town Road, *Campbell*! Brandon Hill Road, *Thompson*! Hope, 700 ft.; Papine Corner; *Harris*! Rio Cobre, near Bog Walk, *Harris & Britton*! *Fl. Jam.* 5850, 6966, 8075, 8091, 8307, 10,531.—Bermuda, Cuba, Hispaniola, Porto Rico, Guadeloupe, Dominica, Martinique, St. Vincent, Trinidad, continental America (from Canada to Paraguay).

Plant very variable in size. Stem ascending, glabrous. Leaves lanceolate, acuminate, narrowing to the base, glabrous but pubescent on margin and nerve, shortly stalked, pellucid-punctate, generally 8-13 cm. (incl. stalk). Racemes 1-3, erect, slender, more or less interrupted at base, 5-8 cm. l. Bracts funnel-shaped, truncate, margin sometimes with short bristles, with 1 to 4 flowers, pedicels at length exserted. Flowers white. Perianth 5-partite; stamens 8, included; style 3-fid. Nut 3-angled, 3 mm. l.

2. *P. acuminatum* *H. B. & K. Nov. Gen. & Sp. ii.* 178 (1817); not glandular-punctate; stipules hispid, ciliate with long bristles.—*Meisn. in DC. Prodr. xiv.* 114; *Griseb. loc. cit.*; *Lindau loc. cit.*; *Urb. tom. cit.* 212.

*Distin*! lagoons above Ferry, *Purdie*! banks of Ferry River, 100 ft.; *Harris*! *Fl. Jam.* 9044.—Cuba, Porto Rico, Guadeloupe, Martinique, Trinidad, continental America.

Stem glabrate; younger branches often hispid. Leaves lanceolate, acuminate, narrowed to base, hispid with short hairs, at length glabrescent except on the margin and nerves, to 20 cm. l. Racemes geminate or branched, linear, continuous, 5-9 cm. l. Peduncles hispid near apex or glabrescent. Bracts contiguous, ciliate with long bristles, funnel-shaped, truncate, several-flowered; pedicels exserted. Flowers white, 2.5 mm. l. Perianth 4-5-partite; stamens 5-8 included; style 3-fid (occasionally 2-fid) included. Nut 3-angled (sometimes biconvex), smooth.

3. *P. mexicanum* *Small in Bull. Torr. Cl. xix.* 356 (1892); branches below glabrous, above hispidulous becoming glandular; peduncles glandular-hispidulous; stipules without cilia; leaves linear-lanceolate.—*Small in Mem. Columb. Coll. i.* 60, *t. 17*. *P. pensylvanicum* *Lindau tom. cit.* 213 (1899) (non Linn.); *Urb. loc. cit.*

Shuttlewood, *Fawcett*!—Louisiana, Texas, Mexico.

Stem erect, more or less branched. Stipules hirtellous on nerves. Leaves shortly stalked, to 14 cm. l., to 1.5 cm. br., narrowing at both ends, minutely punctate on upper surface, puberulous on both sides, hirtellous on margin and nerve. Racemes 2-4.5 cm. l., paniculate, slender, continuous or sometimes interrupted at base, dense-flowered. Bracts obliquely funnel-

shaped, about 3 mm. l., glabrous, without cilia, several-flowered; pedicels 2.5-3 mm. l. *Perianth* 5-partite, not glandular, somewhat pellucid-veined, 1.75 mm. l., increasing to 3 mm. in fruit. *Stamens* 7 (6-8) included; style 2-cleft. *Nut* lens-shaped, almost orbicular, cuspidate with the persistent style-base, flattish, 3 mm. l. (incl. style-base), black.

4. *P. glabrum* Willd. *Sp. Pl. ii.* 447 (1799); glabrous; stipules without cilia; leaves lanceolate.—*Meisn. loc. cit.*; *Hook. f. Fl. Br. Ind. v.* 34; *Wight Ic. t.* 1799; *Griseb. loc. cit.*; *Urb. loc. cit.* *P. portoricense* *Bert. ms. e.c* *Endl. Gen. Suppl. iv. pt. 2, 47* (1847); *Small op. cit.* 46, *t. 10*. *Persicaria urens* &c. *Sloane Cat. 47* & *Hist. i.* 140.

In ponds and marshes; *Sloane* *Herb. ii.* 104! *Broughton!* *Distin!* *St. Mary, McNab!* Constant Spring pond, 600 ft., *Campbell!* Banks of Ferry River, 100 ft., *Harris!* Banks of Rio Cobre, near Bog Walk, *Harris & Britton!* *Fl. Jam. 6141, 9045, 10,530*.—Tropics in America, Africa and Asia.

*Stem* 2-4 ft. *Stipules* truncate. *Leaves* acuminate. *Racemes* slender, panicled, continuous. *Peduncles* glandular or not. *Bracts* 2-6-flowered, contiguous, shortly funnel-shaped, obliquely truncate, without cilia. *Perianth* white or rosy, variable in size, 5-partite. *Stamens* 6-8, about as long as calyx. *Styles* 2, about as long as perianth. *Nut* biconvex, black.

### [§ 2. Flowers capitate in corymbs.

*P. chinense* L. *Sp. Pl. 363* (1753); *Meisn. in DC. Prodr. xiv.* 130; *Wight Ic. t.* 1806; *Hook. f. tom. cit. 44.*

Naturalised at Cinchona, 4500-5000 ft., *Harris!* *Fl. Jam. 9107*.—E. Indies to Japan.

*Stem* erect, trailing, branching. *Leaves* ovate-elliptical or elliptical, entire, base truncate-obtuse, decurrent forming more or less wings on petiole; petioles with deciduous rounded auricles at their base. *Stipules* long, tubular, without cilia. *Flowers* capitate, capitula in a simple or paniculate corymb, peduncles of the capitula hispidulous. *Bracts* foliaceous, acute, cordate.]

### 3. COCCOLOBA L.

Trees or shrubs. Leaves alternate, entire. Flowers hermaphrodite, solitary or clustered within small ochreiform bracts, clusters in spike-like racemes, racemes simple, solitary or rarely two or three together, or paniculate, terminal and axillary. Perianth 5-partite, at length more or less fleshy, and enveloping and attached to the nut. Stamens 8; filaments connate at base; styles 3; stigmas more or less dilated. Nut crowned with the limb of the perianth, but in *C. venosa* protruding above it. Embryo enclosed in the ruminate endosperm, with foliaceous cotyledons.

Species about 140, in tropical and subtropical America, including West Indies.

## § 1. Bracts and ochreolæ small or minute.

Inflorescence a panicle with branches distant from base; flowers small..... 1. *C. polystachya*.

Inflorescence a panicle with numerous branches in a cluster at base; flowers large..... 2. *C. Plumieri*.

Inflorescence a solitary raceme, or rarely 2 or 3 racemes.

Flowers sessile or subsessile (pedicels less than 1 mm. l.).

Racemes not longer than leaves..... 8. *C. troyana*.

Racemes longer than the leaves.

Leaves roundish-elliptical, subcordate at base, drying a light brown or buff..... 5. *C. Krugii*.

Leaves elliptical, generally obtuse at base, drying a dark brown.

Venation obsolete (when dry)..... 4. *C. pirifolia*.

Venation apparent.

Veins inconspicuous..... 7. *C. neglecta*.

Veins conspicuous..... 6. *C. diversifolia*.

Flowers evidently stalked (pedicels 1-8 mm. l.).

Leaves broader than long, generally very large.

Leaves glabrous..... 14. *C. Uvifera*.

Leaves pubescent on nerves..... 13. *C. pubescens*.

Leaves longer than broad.

Leaves membranous..... 15. *C. tenuifolia*.

Leaves more or less leathery.

Leaves with rounded apex..... 9. *C. laurifolia*.

Leaves not with a rounded apex.

Leaves small—not exceeding 8 cm. l.

Veins on upper surface only seen with a lens (when dry)..... 16. *C. Priorii*.

Veins on upper surface evident..... 11. *C. Harrisii*.

Leaves large—exceeding 8 cm. l.

Leaves broadly elliptical.

Racemes lax, not exceeding 10 cm.

l. ; nodules 1-flowered..... 3. *C. zebra*.

Racemes dense, more than 10 cm.

l. ; nodules 3-flowered..... 10. *C. litoralis*.

Leaves oblong-elliptical or ovate-elliptical..... 12. *C. longifolia*.

§ 2. Bracts and ochreolæ large, bracts blackish, ochreolæ lax membranous.

Leaves papery-membranous..... 17. *C. venosa*.

Leaves leathery..... 18. *C. nigra*.

Species insufficiently known..... 19. *C. excoriata*.

§ 1. *Eucoecoloba*. Bracts and ochreolæ small or minute.

1. *C. polystachya* Wedd. in *Ann. Sc. Nat. sér. 3, xiii.* 261, var. *jamaicensis* Fawc. & Rendle in *Journ. Bot. li.* 125 (1913); twigs glabrous; leaves papery, roundish-elliptical, apex rounded, base broadly subcordate or truncate, quite glabrous, nerves slightly prominulous on upper surface, prominent beneath, veins reticulate, prominulous on both sides, more conspicuous above; ochreæ glabrous, somewhat lax, deciduous, with leaf attached

above the middle; inflorescence a panicle branching near the base, lax-flowered; rhachis and bracts tomentellous; nodules generally 1-flowered; flowers subsessile, small; fruit not seen. Type in Herb. Kew.

In fl. Jan.; interior of Westmoreland, *Purdie*!

Leaves 14-15 cm. l., 9-11.5 cm. br.; petioles 2 cm. l. *Ochreæ* 7-9 mm. l. Panicle 17 cm. l. Bracts and ochreolæ about 1 mm. l.; pedicels generally shorter, sometimes slightly longer, jointed at top. *Perianth*, tube about 1 mm. l., lobes about 1.5 mm. l., elliptical, apex rounded.

The species occurs in tropical S. America, and is not known from the West Indies where the variety only occurs.

2. *C. Plumieri* *Griseb.* *Fl. Br. W. Ind.* 162 (1859); plant glabrous; leaves large, springing from lower half of stipule, broadly oblong-elliptical, obtuse or shortly acuminate, base usually cordate or often subpeltate, nerves and veins prominent, especially beneath; ochreæ truncate, lax, ample, deciduous; inflorescence a contracted panicle, branches (3-11) more or less clustered, lax-flowered; nodules 1-flowered; bracts minute; pedicels of flowers almost none, of fruit about 1.5 mm. l., jointed at base; fruit large, ovate-conical, crowned by the connivent perianth-lobes.—*Lindau in Engl. Bot. Jahrb. xiii.* 134, t. V. f. 9 & in *Symb. Ant.* i. 220.

Mountain Grape.

*Wright*! *Purdie*; *Moneague, March*! *Moneague, Prior*! *Mandeville, Britton*, 3233!

Arborescent shrub. Leaves 14-26 cm. l., 10-17 cm. br.; petioles 2.5-4.5 cm. l. *Ochreæ* about 10 mm. l. *Racemes* 15-25 cm. l. *Perianth*, tube 1.5-2 mm. l., lobes 2.5 mm. l. *Ovary* about 2 mm. l.; styles 1.5 mm. l. *Fruit* 18-12 mm. l., 12-10 mm. br.; perianth-lobes about 3 mm. l.

3. *C. zebra* *Griseb.* *Fl. Brit. W. Ind.* 162 (1859); twigs glabrous; leaves attached at base of stipules, broadly elliptical, obtuse or shortly acuminate, rounded or emarginate at the base, glabrous; nerves prominulous beneath, veins on both sides densely reticulate; ochreæ adpressed; racemes lax-flowered, nodules 1-flowered; rhachis obscurely tomentellous; pedicels jointed at the top, exceeding the minute bracts and ochreolæ; fruit large, ovate-conical, the lobes about  $\frac{1}{3}$  length of fruit.—*Lindau in Engl. Bot. Jahrb. xiii.* 135, t. V. f. 10 & in *Urb. Symb. Ant.* i. 220. Type in Herb. Kew.

Zebra Wood.

*Wilson*! *March*.

"A very large timber tree; wood variegated" (Griseb.). Leaves 20-12 cm. l., 12-8 cm. br., petioles 1.5-2.5 cm. l. *Ochreæ* 1.2-1.6 cm. l. *Racemes* 10-6 cm. l. *Pedicels* 3-4 mm. l., spreading or cernuous. *Perianth*, tube about 2 mm. l., 4 mm. in diam., lobes as long as or shorter than tube, puberulous. *Stamens* short, subinclined. *Styles* exserted. *Fruit* 1.6 cm. l., 1.2-1.8 cm. br., lobes about 5 mm. l.

Timber very suitable for building purposes (Wilson).

4. *C. pirifolia* Desf. *Cat. Hort. Par.* ed. 3, 389 (1829); plant glabrous; leaves (in Jamaican specimen) roundish-ovate or elliptical, apex obtuse to rounded, base subcordate to obtuse; nerves on upper surface inconspicuous, underneath scarcely prominent, veins not conspicuous; ochreæ adpressed, deciduous; racemes longer than the leaves, nodules 1-flowered, pedicels wanting; fruit (not seen in Jamaican specimen) globose, shortly

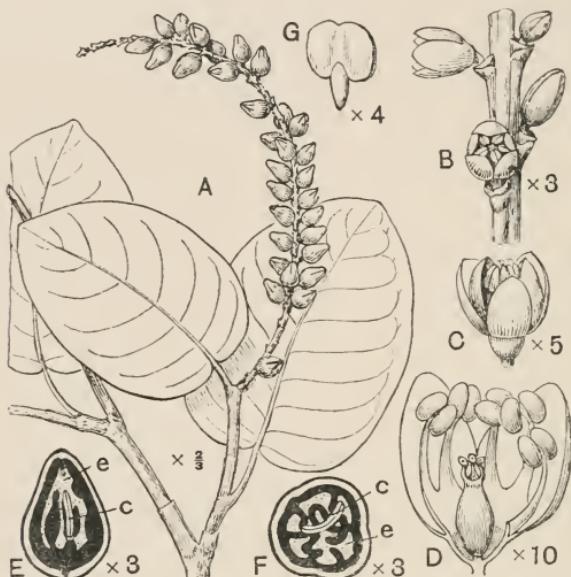


Fig. 34.—*Coccocloba Krugii* Lindau.

A, Twig with leaves and raceme.  
 B, Portion of raceme.  
 C, Flower.  
 D, Flower with portion of perianth and 3 stamens removed.  
 E, Fruit cut lengthwise.  
 F, Fruit cut transversely.  
 G, Embryo.  
 c, cotyledons; e, endosperm.

stalked, crowned by the perianth-lobes.—*Lindau* in *Engl. Bot. Jahrb. xiii.* 144, t. V. f. 13 & 13a & in *Urb. Symb. Ant.* i. 222. C. *Kunthiana* *Meisn.* in *DC. Prodr. xiv.* 166.

In fl. Jan.–Aug.; rocks near the sea, Great Valley, Manchester, *Purdie*! *Wilson*!—Porto Rico, St. Thomas.

Shrub 10 ft. high, or tree 15 to 30 ft. or more. Leaves 6–12 cm. l., 4–5.5 cm. br., attached below base of ochreæ, reddish-brown (when dry); petioles as long as the ochreæ, about 1 cm. l. Racemes terminal, peduncle scarcely 1 cm. l.; bracts triangular, 1.5 mm. l.; ochreolea as long as the bract. Flowers white or greenish-white (Sintenis). Perianth, tube 1 mm. l, lobes 2.5 mm. l. Stamens as long as the perianth-lobes. Ovary 1.5 mm. l.; styles (sometimes 4) nearly 1 mm. l. Fruit red (Sintenis), about 4 mm. br.; perianth and lobes about 2 mm. l.

5. **C. Krugii** *Lindau in Engl. Bot. Jahrb. xiii.* 145 (1890); plant glabrous; leaves leathery, roundish-elliptical, base subcordate, nerves flat on upper surface, slightly prominent beneath, veins finely reticulate beneath, not very conspicuous; ochreæ adpressed; racemes generally longer than the leaves; nodules generally 1-flowered; fruit pear-shaped, with the perianth-lobes adpressed, about half the length of the fruit.—*Lindau in Urb. Symb. Ant. i.* 222. (Fig. 34.)

In fl. July–Nov., in fr. Nov.–Feb.; Great Goat Is.; Yardley Chase, 1600 ft.; Long Mountain, 900 ft.; *Harris!* Fl. Jam. 9335, 9667, 10,008, 10,014; Cross, Clarendon, *Craig!*—Bahamas, Porto Rico, Barbuda.

*Tree* 15–20 ft. high, or *shrub*; branches ashen-grey, lenticels brown. *Leaves* 3·7 cm. l., 2–6 cm. br., inserted below the ochreæ, yellowish or brownish-yellow (when dry); petioles 4–7 mm. l. *Ochreæ* 4–8 mm. l., very thin, almost translucent, deciduous. *Racemes* somewhat dense-flowered; peduncle 5–1 cm. l.; bracts 7·5–1 mm. l.; ochreolæ scarcely longer than the bracts; pedicels to nearly 1 mm. l. *Flowers* green. *Perianth*, tube about 5 mm. l., lobes elliptical, 1·5 mm. l. *Ovary* 1 mm. l.; styles very short. *Fruit* 5–6 mm. l., 4–5 mm. br.

6. **C. diversifolia** *Jacq. Enum. Pl. Carib.* 19 (1760); branches glabrate; leaves ovate or elliptical, apex rounded or shortly acuminate, base acute to truncate, sometimes cordate, nerves and veins prominent on both sides; ochreæ adpressed; racemes simple, lax-flowered, rhachis glabrous, nodules 1–2-flowered; ochreolæ after the fall of the fruit persistent, well developed, and somewhat flattened horizontally; flowers subsessile; fruit ovate-ellipsoidal, base rounded, crowned by perianth-lobes.—*Jacq. Sel. Stirp. Amer.* 114, t. 76 & *ed. pict.* t. 113; *Hook. Exot. Fl.* t. 102; *Meisn. tom. cit.* 159; *Lindau in Urb. Symb. Ant. i.* 223. *C. barbadensis* *Jacq. Enum. Pl. Carib.* 37 (1760) & *Observ. i.* 18, t. 8; *Meisn. tom. cit.* 153; *Lindau in Engl. Bot. Jahrb. xiii.* 148, t. V. f. 16. *C. punctata* *L.* var. *microstachya* *Griseb. Fl. Br. W. Ind.* 163 (fide specimen from Moneague, collected by Prior, in *Herb. Kew.*).

#### Red Grape, Wild Grape.

In fl. April–July, Nov., Dec., in fr. Nov.–Feb.; *Wright*; *Broughton!* *Shakspear!* *Macfadyen!* *Wilson!* Moneague, *Prior!* *March*; *Eggers*; Providence Road, 700 ft.; Brandon Hill, 1000 ft.; *Thompson!* near Claverty Cottage; David's Hill; Content Road; Sheldon; Silver Hill; Cedar Hurst; Charlton, near Ewarton; Holly Mount, 2600 ft.; near Troy, 2000 ft.; Stony Hill, 1200 ft.; Peckham and Crofts Mt., Clarendon, 2500 ft.; *Harris!* Fl. Jam. 5088, 5089, 5090, 5091, 5092, 5096, 5263, 5274, 5500, 6699, 6739, 8062, 8901, 9094, 11,133, 11,194, 11,219.—Bahamas, West Indies as far south as St. Lucia and Barbados.

*Tree* 15–40 ft. high. *Leaves* attached just above base of ochreæ, 5–12 cm. l., 4–8 cm. br., on old branches much larger, glabrous; petioles 7–12 mm. l. *Ochreæ* deciduous. *Racemes* longer than the leaves; pedicels 8 mm. l. *Bracts* about 1·4 mm. l., upper half conical, apex rounded; ochreolæ about 2 mm. l. *Perianth* greenish, tube about 1 mm. l., lobes broadly elliptical, about 2 mm. l. *Fruit* 8–10 mm. l., perianth-lobes 2 mm. l.

7. *C. neglecta* *Fawc. & Rendle* in *Journ. Bot. li.* 124 (1913); twigs glabrous; leaves broadly elliptical, apex rounded or sub-acuminate, base acute, obtuse or rounded, nerves prominent beneath, veins inconspicuous; ochreæ, apex deciduous, persistent below; racemes longer than the leaves, somewhat dense-flowered; rhachis slender, ribbed, tomentellous or glabrous; nodules 1-2-flowered, approximate; pedicels very short, in fruit about twice as long as the minute ochreolæ; ochreolæ not reflexed in fruit; fruit broadly ovoid, base rounded, crowned by perianth-lobes. Type in Herb. Jam.

In fl. July, in fr. Feb.; Green Valley, Blue Mts., *Harris!* Fl. Jam. 5094 (in part), 5233.

Leaves attached just above base of ochreæ, 5-7 cm. l., 3-4.5 cm. br., glabrous; petioles 5-6 mm. l. *Ochreæ* about 8 mm. l. *Racemes* 8-14 cm. l.; pedicels scarcely 1 mm. l. *Bracts* about 1.6 mm. l., upper half triangular, apex obtuse; ochreolæ scarcely 1 mm. l. *Perianth*, tube about 1 mm. l., lobes broadly elliptical, about 2 mm. l. *Stamens* about as long as perianth-lobes. *Fruit* 8 mm. l. (incl. lobes), about 5 mm. br.; lobes 1-1.5 mm. l.

8. *C. troyana* *Urb. Symb. Ant. vi.* 8 (1909); plant glabrous; leaves broadly ovate-elliptical, shortly acuminate, base cordate, nerves on both sides prominent, veins prominulous on both sides with a fine-meshed network; ochreæ adpressed; racemes not longer than the leaves; nodules 1-flowered; fruit ellipsoidal, slightly narrowed at the base, perianth-lobes extending down to the middle.

In fl. March, in fr. Oct., Nov.; near Troy, 2000-2200 ft., *Harris!* John Crow (Blake) Mts. 1700 ft. *Harris & Britton!* Fl. Jam. 9439, 9474, 10,653, 10,764.

Tree 20-40 ft. high. Leaves attached at the base of the ochreæ, 7-10 cm. l., 4.5-7 cm. br.; petiole 1.5-2 cm. l. *Ochreæ* deciduous, to 1.3 cm. l. *Racemes* lax-flowered, 2.5-9 cm. l., peduncles .5-1 cm. l. *Pedicels* jointed at apex, .5-1 mm. l. *Bracts* scarcely 1 mm. l., ovate, upper part deciduous; ochreolæ minute or not conspicuous. *Perianth*, tube 1.2 mm. l., 1 mm. br., lobes elliptical, about 2 mm. l. *Fruit* 1 cm. l., 6-7 mm. br.

9. *C. laurifolia* *Jacq. Hort. Schoenbr. iii.* 9, t. 267 (1798); plant glabrous; leaves elliptical, apex rounded, base obtuse, nerves and veins prominent on both sides; ochreæ somewhat lax; nodules 1-2-flowered; bracts and ochreolæ minute; pedicels of fl. l. nearly 2 mm. l., of fr. 3 mm. l., spreading horizontally; fruit somewhat pear-shaped, the lobes forming a rounded, somewhat mammiliform apex.—*Meisn.* in *DC. Prodr. xiv.* 165; *Lindau* in *Engl. Bot. Jahrb. xiii.* 158, t. V. f. 23, 23a & in *Urb. Symb. Ant. i.* 227. *C. floridana* *Meisn.* loc. cit. (1856). *Coccolobis laurifolia* *Sarg. Silv. vi.* 119, t. 300.

Pigeon Plum of Florida.

In fl. March-July, in fr. Nov.-July; *Wright!* March! Sheldon, Blue Mts.; Content Road, above Gordon Town, 2300 ft.; *Harris!* Fl. Jam.

5093, 5188, 6132. Cross, Clarendon, Craig!—Florida, Bahamas, Cuba, Hispaniola, Porto Rico, St. Cruz, Venezuela.

*Tree* 25 ft. high or more, or a *shrub*. *Leaves* (in Jamaican specimens) 6–12 cm. l., 4–8 cm. br., attached just above base of *ochreæ*, petioles 1–1.5 cm. l. *Ochreæ* obliquely truncate, base persistent, more or less deciduous above, 7–9 mm. l. *Racemes* about as long as leaf, lax-flowered. *Perianth*, tube about 1.5 mm. l., shortly campanulate, contracted at base, lobes roundish, about 2 mm. l. *Fruit* about 1.4 cm. l., 1 cm. br., lobes 3 mm. l.

“The wood is heavy, exceedingly hard, strong, brittle and close-grained . . . and in Florida is occasionally used in cabinet-making” (Sargent).

10. *C. litoralis* *Urb. Symb. Ant. vi.* 9 (1909); twigs glabrous; leaves large, broadly elliptical to roundish ovate, apex sometimes very shortly and obtusely acuminate, the older leaves somewhat cordate at base, nerves and veins on both sides prominent; *ochreæ* ample, glabrous, persistent, apex somewhat lax and deciduous; racemes long, 2 together, one terminal, the other adjacent in axil of upper leaf, solitary in upper axils, nodules generally 3-flowered, rhachis glabrous.

In fl. March; near the rocky sea-coast amongst Coco-nut palms, Negril, *Harris!* Fl. Jam. 10,228.

*Tree* 40 ft. *Leaves* attached above base of *ochreæ*, 20–14 cm. l., 16–10 cm. br.; petiole 1–1.5 cm. l. *Ochreæ*, persistent portion 5–1 cm. l. *Racemes* 13–33 cm. l., dense-flowered. *Pedicels* 1–2.5 mm. l., jointed near apex. *Perianth*, tube scarcely 2 mm. l.; lobes elliptical, 2.5 mm. l., scarcely 2 mm. br. *Stamens* as long as perianth-lobes. *Fruit* not seen.

11. *C. Harrisii* *Lindau in Urb. Symb. Ant. i.* 228 (1899); plant glabrous; leaves elliptical or roundish-elliptical, shortly acuminate, base rounded, nerves and veins on both sides prominent; *ochreæ*, apex somewhat lax and deciduous, base adpressed and persistent; nodules 1-flowered; pedicels 4 or 5 times as long as the bracts; fruit not seen.

In fl. Feb., July, Nov.; Vinegar Hill, Blue Mts., 3500–4000 ft., *Harris!* Fl. Jam. 5089, 5481, 7667.

*Tree* 30 ft. high. *Leaves* 5–8 cm. l., 3–4.5 cm. br.; petioles 1–1.5 cm. l. *Ochreæ* about 1.2 cm. l. *Raceme* lax-flowered, as long or a little longer than the leaf; bracts and bracteoles 5 mm. l.; pedicels of fl. 1.5–3 mm. l. *Perianth*, tube about 1 mm. l., lobes roundish, about 2 mm. br., reflexed in flower.

12. *C. longifolia* *Fisch. ex Lindau in Engl. Bot. Jahrb. xiii.* 161 (1891); twigs glabrous, sometimes tomentellous; leaves large, oblong-elliptical or ovate-elliptical, acuminate, base rounded or subcordate, nerves and veins prominent on both sides; *ochreæ* glabrous or sometimes tomentellous, adpressed but lax at apex; racemes somewhat lax-flowered: nodules 1-flowered (sometimes 2–3-flowered); rhachis minutely tomentellous or glabrate; pedicels much longer than the *ochreolæ*, ultimately spreading horizontally; fruit roundish-ovoid, perianth-lobes about one-third of length.—

*Lindau in Urb. Symb. Ant.* i. 229. *C. venosa* *Griseb.* ms. in *Herb. Kew.* (non *L.*); *Lindau in Engl. Bot. Jahrb.* xiii. 152 & in *Urb. Symb. Ant.* i. 225. *C. excoriata* *Meisn.* in *DC. Prodr. vir.* 168 (1856) (non *L.*). *C. diversifolia* *Griseb.* *Fl. Br. W. Ind.* 163 (in part, non *Jacq.*).

Wild Grape.

In fl. April, May, in fr. Aug.-April; *Swartz*; *Cuming*; lower mountains of Manchester, *Purdie*! *Wullschlaegel*; *Moneague*, *Prior*! *Claverty Cottage*, J.P. 1456, *Hart*! *Constant Spring*, *Campbell*! sea-coast, *Hectors River*; *New Green*, *Mandeville*, 2200 ft.; *Holly Mount*, near *Mt. Diabolo*, 2600 ft.; near *Troy*, 2000-2500 ft.; *Oxford*, near *Troy*, 1400 ft.; *Leicester-field*, *Upper Clarendon*; *Peckham*, *Upper Clarendon*; *Harris*! *New Green*, *Mandeville*; *Martin's Hill*, *Mandeville*; foothills of *John Crow (Blake) Mts.*; *Harris & Britton*! *Fl. Jam.* 5714, 6005, 6317, 6489, 8719, 8772, 9462, 9489, 10,597, 10,617, 10,689, 10,756, 10,758, 10,840, 10,873; *Union Hill*, near *Moneague*; *Britton & Hollick*, 2663, 2667! *Grierfield*, near *Moneague*; *Britton*, 2773, 2777!

Tree 15-30 ft. Leaves from near base of ochreæ, 10-30 cm. l., 4-12 cm. br.; petioles 1-2.5 cm. l. Ochreæ short, triangular, apex deciduous, rest persistent, 5-1.5 cm. l. Bracts triangular, 5-1 mm. l., somewhat tomentellous; ochreolæ equaling bracts, more or less tomentellous. Pedicels 2-5 mm. l. Flowers greenish-yellow. Perianth tomentellous, tube about 2 mm. l., lobes about equaling tube or somewhat longer. Fruit about 1 cm. l., about 7 cm. br.

"A very good timber" (Purdie).

13. *C. pubescens* *L. Syst. ed.* 10, 1007 (1759); leaves large, roundish or broadly elliptical, broader than long, base cordate, glabrescent on upper surface but generally pubescent on nerves, rusty-pubescent beneath, nerves and veins impressed above, prominent beneath; ochreæ ample, deciduous; racemes terminal; nodules 1-3-flowered, rhachis minutely puberulous.—*L. Sp. Pl. ed.* 2, 523; *Hook. Bot. Mag. t.* 3166; *Meisn.* in *DC. Prodr. xiv.* 152; *Griseb. Fl. Br. W. Ind.* 161; *Lindau in Engl. Bot. Jahrb. xiii.* 202; *Fawc. & Rendle in Journ. Bot. li.* 123. *C. grandifolia* *Jacq. Enum. Pl. Carib.* 19 (1760) & *Sel. Stirp. Amer.* 113; *Lindau in Urb. Symb. Ant.* 230. *Scortea arbor americana*, amplissimis foliis aversa parte nervis extantibus, hirsutie ferruginea refertis. Leathercoat-tree *Barbadensis nostris*. *Pluk. Phyt. t.* 222. f. 8 (*Herb. Sloane xcvi. 23, ci. 196*). *Coccolobis arborea*, foliis orbiculatis integris *Browne Hist. Jam.*, 210. Type in *Herb. Mus. Brit.*

Leather-coat tree (Barbados), Bois à grandes feuilles (Martinique).

*Wright*!—*Hispaniola*, *Porto Rico*, *Antigua*, *Guadeloupe*, *Dominica*, *Martinique*, *Nevis*, *St. Lucia*, *Barbuda*, *Barbados*, *Mexico*, *Guiana*.

Leaves 1 or even 2 ft. broad; petioles short, attached at base of ochreæ. Racemes 1.5-2 dm. l. Bracts and ochreolæ 1 mm., minutely puberulous. Pedicels jointed at top, 4-5 mm. l. Perianth, tube about 5 mm. l., lobes about 1 mm. l. Fruit not seen, described as "ovoid or globose."

*Browne* identifies a plant in *Jamaica* with this species, and says it is common between *Kingston* and *Bull Bay*, but is of low growth, seldom

rising above 5 or 6 feet. This species, like *C. Uvifera*, is low-growing in Jamaica, but according to Jacquin rises to a height of 60 or 80 feet in Martinique. He describes the wood as red, heavy, very hard, easily splitting, and almost indestructible, and says it is used for stakes, piles and beams, that it lasts for centuries without showing any decay, and that part which is buried in the earth becomes changed into the hardest stone.

14. *C. Uvifera* L. *Syst. ed.* 10, 1007 (1759); twigs tomentellous; leaves roundish to reniform, generally broader than long, nerves immersed or scarcely prominent on upper surface; ochreae ample, lax, tomentellous, base persistent; rhachis tomentellous, nodules 1-4-flowered.—*Jacq. Enum. Pl. Carib.* 19, *Sel. Stirp. Amer.* 112, *t.* 73 & *Ed. pict.* *t.* 110; *Hook. Bot. Mag.* *t.* 3130; *Meisn. Mon. Pol. Prodr.* 8, 32, *t. I. f.* 4, *II. B.* *V. f.* 1 & *in DC. Prodr.* *xiv.* 152; *Griseb. Fl. Br. W. Ind.* 161; *Lindau in Engl. Bot. Jahrb.* *xiii.* 204, *t. v. f.* 50, 50a, 50b, & *in Urb. Symb. Ant.* *i.* 231. *Prunus maritima* &c. *Sloane Cat.* 183 & *Hist.* *ii.* 129, *t. 220, f. 3-5*; *Catesb. Carol.* *ii.* 96, *t. 96*. *Uvifera litorea* &c. *Pluk. Alm.* 394 & *Phyt.* *t.* 236, *f. 7*. *Coccolobis foliis crassis orbiculatis* &c. *Browne Hist. Jam.* 209. *Gujabara racemosa* &c. *Plum. Ovied. lib.* 8, *cap. 13* & *Pl. Amer. (Burm.)* 136, *t. 145*. *Coccolobis uvifera* *Sarg. Silv.* *vi.* 115, *tt.* 298, 299.

#### Sea-side Grape.

On sea-shore; *Sloane Herb.* *vii.* 69! *Broughton!* *Macfadyen!* Mam mee Bay; sea-coast near St. Ann's Bay; *Prior!* *March!* *Seemann!* *Harris!* *Fl. Jam.* 5978.—Bermuda, Cayman Is., Bahamas, West Indies, eastern shores of tropical continental America.

Small tree, 6-15 ft. high, or shrub. Leaves 8-14 cm. l. or larger, leathery, attached on base of ochreae (5-1 cm. l.). Racemes somewhat dense-flowered, as long as, or longer than, the leaf. Flowers white. Perianth, tube 1.5 mm. l., lobes ovate, about 2 mm. l. Fruit ellipsoidal, 2 cm. l., including the stalk-like base (2-3 mm. l.); lobes about 4 mm. l.; pericarp fleshy, edible, blue-black or purplish. Seed semiglobose, deeply 3-furrowed.

This species grows to 45 ft. high on the shores of continental America. The wood is hard, takes a fine polish, and is used for ornamental work. The fruit is eaten by children, but is so astringent that it should be taken with caution. West Indian or Jamaican Kino is prepared from this species. Wright (Mem. 265) says "the bark is reckoned an excellent astringent in watery purgings and in dysenteries after the inflammatory symptoms have been abated."

15. *C. tenuifolia* L. *Syst. ed.* 10, 1007 (1759); leaves membranous to subcoriaceous (when dry), elliptical, sometimes very shortly acuminate, nerves slightly prominent beneath, veins not conspicuous, stalks tomentellous; ochreae tomentellous; racemes dense-flowered, slender, longer than leaves, rhachis tomentellous, nodules 1-3-flowered, pedicels short; fruit sub-globose, with lobes about one-third length of fruit.—*L. Aman.* *v.* 397 (1760); *Fawc. & Rendle in Journ. Bot. li.* 124. *C. jamaicensis* *Lindau in Engl. Bot. Jahrb.* *xiii.* 206 (1890) & *in Urb.*

*Symb. Ant.* i. 232. *C. leptostachyoides* *Lindau* in *Engl. Bot. Jahrb.* xiii. 207 (1890). *Coccolobis?* *frutescens* &c. t. 14, f. 3, *Browne Hist. Jam.* 210. Type in *Herb. Linn.*

Fl. July-Sept., fr. Sept.-Nov.; above Bull Bay, *Browne!* *Swartz!* Mt. Faraway, Blue Mts., *J. Watt!* Falls River; Berwick Hill; Green Valley, Blue Mts.; Malvern, 2200 ft; Long Mountain, 700 ft. Fl. Jam. 5097, 5228, 5272, 5343, 5391, 6517, 8862, 9809.

Leaves 3-11 cm. l., 2-8 cm. br.; stalks to 1 cm. l. *Ochreae* to 1.5 cm. l., lower half tubular. *Racemes* to 24 cm. l., terminal on young branches; pedicels to nearly 2 mm. l.; bracts triangular to .75 mm. l., ochreolæ tubular, to .5 mm. l. *Perianth*, tube about 1 mm. l., lobes roundish, 1.5-2 mm. l. *Fruit* 5-6 mm. l., 4 mm. br.; lobes 1.5-2 mm. l.

16. *C. Priorii* *Fawc. & Rendle* in *Journ. Bot. li.* 124 (1913); leaves small, stalked, leathery, glabrous, elliptical, shortly acuminate, base obtuse or rounded, nerves on upper surface flat, beneath prominulous, veins inconspicuous above, netted with fine meshes and flat beneath; *ochreae* glabrous, somewhat lax, persistent, tubular below, 2-toothed at apex; racemes about as long as the leaves, geminate or solitary, terminal, erect, lax-flowered; *rhachis*, *bracts*, *ochreolæ*, *pedicels* and *perianth* minutely tomentellous; nodules 1-flowered; *bracts* and *ochreolæ* minute; *pedicels* jointed at top, much longer than *bracts*; fruit.... *C. tenuifolia* *Griseb.* *op. cit.* 162 (1859) non *L.* Type in *Herb. Kew.*

*Prior!*

Leaves 4-8 cm. l., 2-4 cm. br.; petioles 7-12 mm. l. *Ochreae* 8-12 mm. l. *Racemes* 4-8 cm. l. *Bracts* and *ochreolæ* scarcely .5 mm. l. *Pedicels* 2 mm. l., horizontal. *Perianth*, tube 2-3 mm. l., lobes 1.5-2 mm. l.

§ 2. **Campderia.** Bracts and *ochreolæ* large; *ochreolæ* lax, membranous.

17. *C. venosa* *L.* *Syst. ed.* 10, 1007 (1759); plant quite glabrous; leaves papery-membranous (when dry), shortly stalked, elliptical, narrowed to both ends, often somewhat obovate, apex shortly acuminate, abruptly subacute, base obtuse or emarginate, shiny (fide Jacquin), nerves with well defined arches near the margin, flat or semi-immersed on the upper surface, prominulous beneath, veins reticulate, slightly prominulous on both sides; *ochreae* membranous, apex long-acuminate, deciduous, base adpressed, persistent; racemes terminal and lateral, shorter or longer than the leaves, dense-flowered, more or less pendulous, bracts several-flowered; flowers shortly stalked; perianth with very short tube; fruit a triquetrous, black, shining nut enveloped in the white succulent perianth.—*Fawc. & Rendle* in *Journ. Bot. li.* 123. *C. nivea* *Jacq.* *Enum. Pl. Carib.* 19 (1760), *Sel. Stirp. Amer.* 115, t. 78 & *Ed. pict.* t. 115; *Sw. Prodr.* 64 & *Fl. Ind. Occ.* 693; *Hughes Hist. Barb.* 179; *Mayc. Fl. Barb.* 156; *Lun.*

*Hort. Jam.* i. 78; *Descourt. Fl. Aut.* v. 178, t. 352; *Meisn.* in *DC. Prodr.* xiv. 168; *Griseb. op. cit.* 163; *Lindau in Urb. Symb. Aut.* i. 233 (excl. syn. *C. excoriata* L.). *C. punctata* L. *Sp. Pl. ed.* 2, 523 (1762). *C. excoriata* *Lindau* (non L.) in *Engl. Bot. Jahrb.* xiii. 211. *Uvifera arbor americana*, *convolvulacea*, *fructu aromatico punctato* *Pluk. Alm.* 394, t. 237, f. 4. *Coccolobis* *foliis oblongo-ovatis venosis, uvis minoribus punctatis* *Browne Hist. Jam.* 210.

Chequered Grape Tree (Browne), Chigery Grape Tree (Hughes), Raisinier de coudre (Jacquin).

*Browne*; *Swartz*.—West Indies.

Tree 20–30 ft., with white hard wood, branches ash-grey. Leaves 8–30 cm. l., 4–9 cm. br.; nerves 8–12 on each side; petioles 5–8 mm. l. *Ochreae* about 1 cm. l. Racemes to 15 cm. l., shortly stalked. Flowers yellowish. Berries edible, sweet.

We have seen no specimen from Jamaica, nor any record of its occurrence there since the time of Swartz. A leaf named *C. nivea* Jacq. in *Herb. Mus. Brit.* from Jacquin's herbarium, proves the identity of this species with *C. venosa* L. Both Jacquin and Swartz describe the racemes as more or less erect, but in the specimens seen they are more or less pendulous as described by Lindau. We are indebted to Mr. J. R. Bovell, Superintendent of the Barbados Agricultural Department, for the loan of specimens in flower and fruit from Barbados.

18. *C. nigra* *Fawc. & Rendle in Journ. Bot. li.* 124 (1913); plant glabrous; leaves leathery, narrowly elliptical to lanceolate, shortly stalked, apex obtuse, base obtuse, nerves and veins prominulous on both sides, veins netted with small meshes; *ochreae* lax, ovate, not tubular, persistent; racemes very dense-flowered, erect, terminal, shorter than the leaves; nodules several flowered; rhachis black; bracts triangular, leathery, *ochreolæ* 2 lobed, mucronate, translucent; pedicels short; perianth with very short tube; fruit not seen. Type in *Herb. Edinb.*

“Jamaica,” fide Grisebach ms. in *Herb. Edinb.* without name of collector.

Leaves 6–10 cm. l., 2·5–4 cm. br.; petioles 4–5 mm. l. *Ochreae* 8 mm. l. Racemes 7·5 cm. l. Bracts 1·5–2 mm. l.; *ochreolæ* 3 mm. l. Pedicels about 1 mm. l. Perianth about 3 mm. l., tube less than 1 mm. l., lobes elliptical.

19. *C. excoriata* L. *Syst. ed.* 10, 1007 (1759). This species is known to us only from a leaf-bearing twig from P. Browne from Jamaica in the Linnean Herbarium, so named in Linnaeus's handwriting.—A stout shoot (apparently a young sucker) 14 cm. l. and ·5 cm. thick with white bark and brown lenticels; leaves 7·5–10 cm. l., 6–7 cm. br., broadly elliptical, very shortly acuminate, base sometimes unequal, rounded, nerves on both sides prominulous, veins inconspicuous, dark brown on upper surface, light brown beneath; petioles and *ochreae* puberulous; *ochreae* dark brown, broadly tubular, truncate, 1 cm. l., permanent base 5–7 mm. l., leaf inserted about middle of permanent base.

In his copy of Browne's Natural History of Jamaica, page 210, Linnaeus identifies his species with the following species of Browne's:—"Coccolobis montana major arborea, foliis subrotundis, cortice levi. The Mountain Grape Tree. This tree is frequent about the Cross in Clarendon; it grows to a considerable size, and is looked upon as a fine timber-wood." Through the kindness of Mr. Robert Craig we have obtained specimens of "Mountain Grape" from the Cross in Clarendon. These comprise two species, *C. laurifolia* and *C. Krugii*, but do not agree with the specimen in the Linnean Herbarium.

[**ANTIGONON** Endl.

Stem climbing, shrubby below. Leaves alternate. Ochreæ scale-like or reduced to a line. Flowers hermaphrodite in terminal and axillary racemes, the peduncle ending in a branched tendril. Perianth with 5 segments, increasing in size in the fruit, coloured, the 3 exterior segments larger, cordate, the 2 interior oblong. Stamens 8 united into a tube, staminodes alternate, tooth-like. Styles 3.

**A. leptopus** Hook. & Arn. *Bot. Beech. Voy.* 308, t. 69 (1840); *Meisn. in DC. Prodr. xiv.* 184; *Hook. f. Bot. Mag.* t. 5816.

**Coralilla.**

Commonly cultivated and sometimes an escape.—Mexico.

Leaves ovate with cordate base, entire, 7-12 cm. l. Perianth bright rose colour, at length about 1 cm. l.]

**FAMILY XV. CHENOPODIACEÆ.**

Herbs or shrubs. Leaves simple, alternate, exstipulate, reduced to scales in *Salicornia*. Flowers 1-2-sexual, small, regular. Perianth inferior, of 3-5 free or connate segments, imbricate in bud. Stamens as many as the perianth-segments, or fewer, and opposite to them. Ovary 1-celled; stigmas 2-5; ovule solitary, basal or lateral, campylotropous. Fruit usually with a bladdery pericarp (*utricles*), enclosed in the often enlarged fleshy calyx. Seeds with or without floury or fleshy endosperm; embryo annular or conduplicate (*Salicornia*).

Species about 550, widely dispersed through the world, mostly in temperate regions, some on the shores of the sea or salt lakes, others in desert places.

Stem leafy. Flowers in clusters or spikes.

Flowers hermaphrodite..... 1. *Chenopodium*.

Flowers unisexual ..... 2. *Atriplex*.

Stem leafless. Flowers sunk in cavities of the joints ... 3. *Salicornia*.

## CHENOPODIUM L.

Herbs, with angled stem. Leaves entire, lobed or toothed. Flowers minute, hermaphrodite or polygamous, in axillary clusters in simple or branched spikes. Perianth-segments generally 5. Stamens equal in number to the perianth-segments. Ovary free; stigmas 2-3. Utricle membranous, included in the perianth. Seed horizontal or vertical, testa crustaceous, endosperm floury; embryo more or less completely annular.

Species about 60, mostly in temperate regions.

Leaves deltoid-ovate ..... 1. *C. murale*.  
Leaves lanceolate-oblong ..... 2. *C. ambrosioides*.

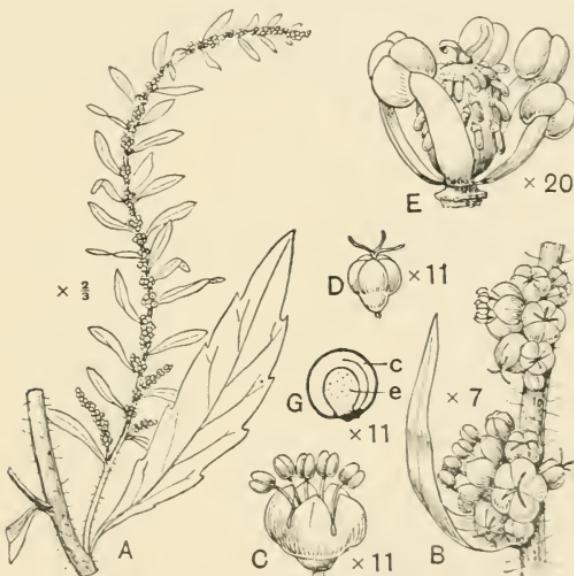


Fig. 35.—*Chenopodium ambrosioides* L.

A, Leaf and inflorescence.  
B, Portion of inflorescence.  
C, Male flower.  
D, Female flower.

E, Hermaphrodite flower, perianth removed.  
F, Seed cut lengthwise; c, cotyledons; e, endosperm.

1. *C. murale* L. *Sp. Pl.* 219 (1753); leaves long-stalked, deltoid-ovate, unequally and acutely toothed, not glandular; flowers hermaphrodite.—*Moq. in DC. Prodr. xiii. pt. 2, 69; Griseb. Fl. Br. W. Ind. 60; Urb. Symb. Aut. iv. 216.* *Blitum pes asperinus* &c. *Sloane Cat.* 49 & *Hist. i.* 144.

Spanish Town, *Sloane Herb.* ii. 111! *McNab!* *Purdie!* *March!* Pasmore Town, *Campbell!* *Fl. Jam.* 6503.—Bahamas, Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, St. Martin, Antigua, Guadeloupe, S. America. Introduced from the Old World.

Plant 1-2 ft. high. Leaves 5-8 cm. l., 4-4.5 cm. br.; petioles to 4 cm. l. Perianth glandular; segments 1.3 mm. l., each with prominent

midrib. Stamens 5, as long as perianth, anthers minute. Stigmas 2. Seed compressed, with a sharp edge; embryo annular, enclosing the endosperm.

2. *C. ambrosioides* L. *Sp. Pl.* 219 (1753); leaves with short stalks, lanceolate-oblong, sinuate-toothed, upper entire, glandular beneath; flowers polygamous.—*Moq. tom. cit.* 72; *Griseb. loc. cit.*; *Urb. loc. cit.*; *Volkens in Engl.-Prantl Pflzsfam.* iii. 1 a, 58, fig. 25, K-Q; *Berg & Schmidt Off. Gen. i. t. 2, c.* (Fig. 35.)

Mexican Tea, Hedge Mustard, Bitter Weed.

*McNab!* March! Gordon Town, *Ball!* J.P. 1381, *Hart!* Castleton road, *Thompson!* Fl. Jam. 8082.—Bahamas, West Indies. Temperate and tropical regions of the whole world.

Plant with an aromatic odour, to 4 ft. high. Leaves 5-8 cm. l., 1-2 cm. br. Flower-clusters with hermaphrodite, female and occasional male flowers. Perianth about 1 mm. l.; segments 5. Ovary with glandular bodies. Hermaphrodite flower with 5 exserted stamens; ovary with 2 or 3 short stigmas. Female flower with 3 long exserted stigmas. Utricle globular. Seed somewhat compressed, smooth, round; embryo not completely annular, imperfectly enclosing the endosperm.

The whole plant has the reputation of being a vermicifuge.

## 2. ATRIPLEX L.

Herbs or shrubs. Flowers unisexual, in axillary clusters or short terminal spikes. Male flowers without bracts. Perianth

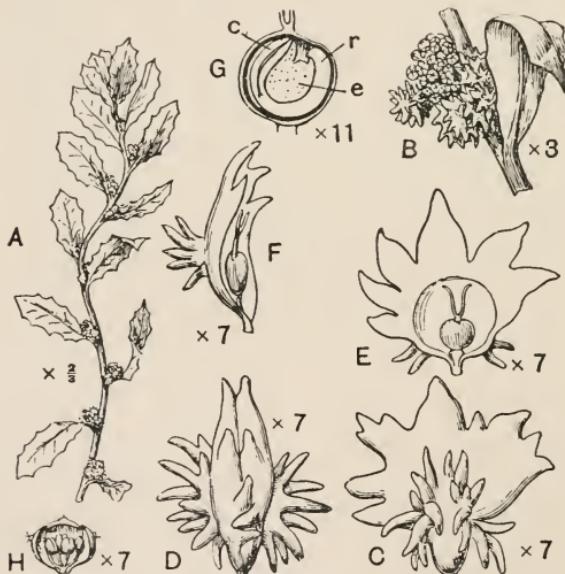


Fig. 36.—*Atriplex cristata* Humb. & Bonpl.

A, Upper flower-bearing portion of stem.

B, Cluster of flowers.

C, Back of bract.

D, Side view of bracts enclosing flower.

E, Female flower with one bract removed.

F, Side view of ditto.

G, Fruit cut lengthwise; c, cotyledons; r, radicle; e, endosperm.

H, Male flower.

4-partite. Stamens 4. Female flower with 2 bracts; bracts flat, enclosing the ovary and dilated in fruit, forming a 2-valved covering to the utricle. Perianth wanting; stigmas 2. Utricle at the base of the greatly enlarged and hardened bracts. Seed with annular embryo surrounding the floury endosperm.

Species about 120, natives of temperate and subtropical regions of the whole world.

*A. cristata* Humb. & Bonpl. ex Willd. *Sp. Pl.* iv. 959 (1805); *Urb. Symb. Ant.* iv. 217. *Obione cristata* Moq. *Chenopod. Enum.* 73 (1840) & in *DC. Prodr.* xiii. pt. 2, 110. (Fig. 36.)

Sandy beach, Pedro Bluff, *Harris!* Fl. Jam. 9932.—Bermuda, Florida, Bahamas, Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, St. Jan, Curaçao, Venezuela, Colombia, Peru.

Plant floury-white, 1-3 ft. high, with numerous diffuse or trailing branches. Leaves elliptical, or oblong, narrowed to base, 1-2 cm. l., 6-8 mm. br. Male and female flowers on the same cluster, the male small and densely crowded. Perianth of male flower scarcely 1 mm. l. Bracts of female flower with large teeth on margin, crested; crests with conical teeth.

### 3. SALICORNIA L.

Succulent, leafless, glabrous herbs, with opposite jointed branches. Leaves represented by opposite scales at the nodes.

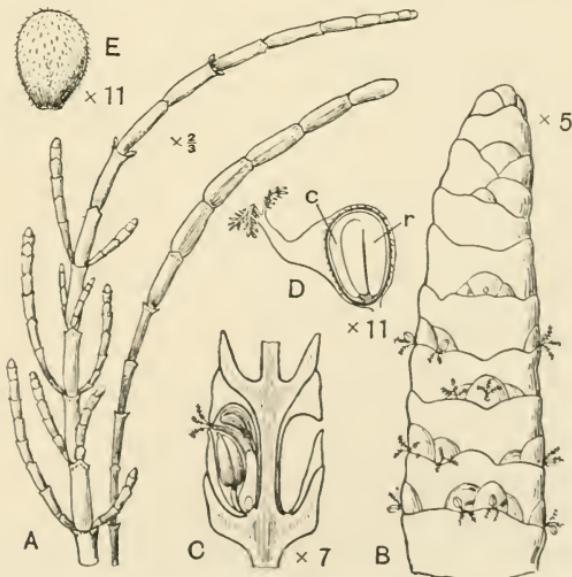


Fig. 37.—*Salicornia ambigua* Michx.

- A, Portion of stem and branch.
- B, Portion of stem in flower.
- C, Small portion of B cut lengthwise, showing a flower enclosed in the perianth and another perianth empty.
- D, Fruit cut lengthwise; c, cotyledons; r, radicle.
- E, Seed.

Flowers in terminal jointed spikes, 3 or more together in cavities of the joints, the flowering areas decussately opposite. Perianth flattish at the top, with a small mouth through which the stamens and stigmas protrude. Stamens 2. Stigmas 2. Utricle enclosed by the perianth which has become spongy. Seed erect, compressed; testa leathery, hispidulous with hooked hairs; endosperm none; embryo conduplicate.

Species about 15, natives of saline soil, widely distributed throughout the world.

*S. ambigua* Michx. *Fl. Bor. Am.* i. 2 (1803); *Griseb. Fl. Br. W. Ind.* 60; *Britton Ill. Fl.* i. 583. *Arthrocnemum?* *ambiguum* Moq. *Chenop. Enum.* 112 (1840) & in *DC. Prodr. xiii. pt. 2*, 151. (Fig. 37.)

**Glass Wort.**

Margins of mangrove swamp, Great Goat Is.; between Portland Point and Rocky Point; *Harris!* *Fl. Jam.* 10,178.—On both shores of American continent, Bahamas, Bermuda.

With a perennial woody rootstock. Stem trailing, 6 in. to 2 ft. long, with ascending slender branches, terete or flattened.

## FAMILY XVI. AMARANTACEÆ.

Herbs, rarely shrubs. Leaves opposite or alternate, exstipulate. Flowers usually in terminal simple or panicled spikes, cymes or clusters (outer flowers of the cluster sometimes deformed); each flower with one bract and two bracteoles which are scarious. Perianth-segments, 5–3 scarious, persistent, imbricate in bud. Stamens 2–5, opposite the perianth-segments, filaments free or connate below or united with intervening staminodes into a hypogynous cup; anthers 1- or 2-celled. Ovary 1-celled; styles 1–3; ovules 1 or more, basal. Fruit with a bladdery pericarp (*utricile*) in Jamaican species, enclosed in or resting on the persistent perianth. Seed erect, roundish, compressed, testa crustaceous; embryo horseshoe-shaped or annular, surrounding the mealy endosperm.

Species about 500, widely dispersed throughout the world.

Leaves alternate.

Flowers hermaphrodite.

Utricle with 2 or more seeds .....	1. <i>Celosia.</i>
Utricle with 1 seed .....	2. <i>Chamissoa.</i>

Flowers unisexual.

Flowers monococious.....	3. <i>Amarantus.</i>
Flowers dioecious .....	4. <i>Acnida.</i>

Leaves opposite.

Flowers in very long spikes. Anthers 2-celled.

Segments of imperfect flowers changed into awns hooked at apex .....	5. <i>Cyathula.</i>
Segments and bracts spinescent .....	6. <i>Achyranthes.</i>

Flowers in short spikes or capitulate. Anthers 1-celled.

Flowers spicate. Perianth woolly, tube crested in fruit..... 7. *Frælichia*.

Flowers capitate. Perianth unchanged in fruit.

Perianth not woolly.

Staminodes present..... 8. *Alternanthera*.

Staminodes wanting. Sea-shore plants..... 9. *Philoxyeris*.

Perianth woolly..... 10. *Gomphrena*.

Flowers in clusters along the branches of a panicle.

Female perianth woolly. Anthers 1-celled ..... 11. *Iresine*.

### 1. CELOSIA L.

Herbs annual, sometimes shrubby. Leaves alternate. Flowers hermaphrodite, in spikes, with persistent bracts and bracteoles white or pink, shining. Perianth scarious, striate or ribbed. Stamens 5, united below into a cup; anthers 2-celled; staminodes

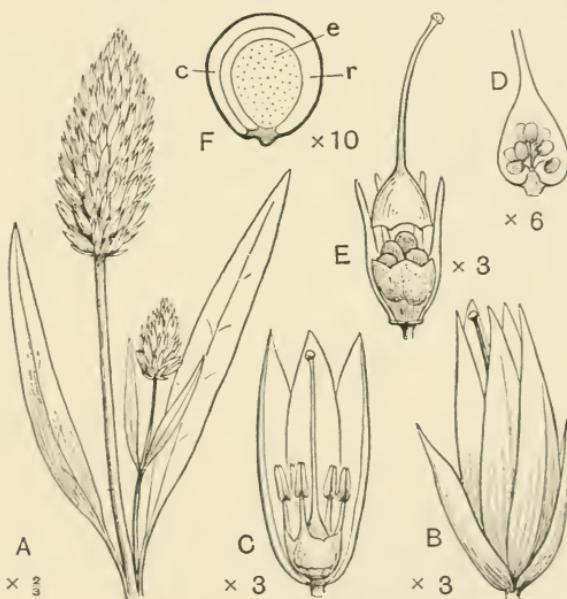


Fig. 38.—*Celosia argentea* L.

A, Upper portion of plant.  
 B, Flower with bract and one bracteole.  
 C, Flower with portion of perianth removed.  
 D, Ovary cut lengthwise.  
 E, Fruit.  
 F, Seed cut lengthwise; c, cotyledons;  
 r, radicle; e, endosperm.

none. Ovary with 2 or more ovules. Utricle circumsciss, sometimes thickened above, with 2 or more seeds. Seeds erect, testa crustaceous.

Species about 40, natives of the tropics.

Leaves lanceolate to linear. Spikes compact, cylindrical... 1. *C. argentea*.  
 Leaves deltoid or oblong-ovate. Spikes lax..... 2. *C. nitida*.

1. *C. argentea* L. *Sp. Pl.* 205 (1753); stem herbaceous; leaves lanceolate to linear; spikes showy, compact, cylindrical or ovate, long-stalked, silvery; style filiform with 2 or 3 minute stigmas.—*Moq. in DC. Prodr. xiii. pt. 2*, 242; *Griseb. Fl. Br. W. Ind.* 62; *Urb. Symb. Ant. iv.* 217. (Fig. 38.)

*Distin!* Bath, *Prior!* River courses, Fort Stewart, *Metcalfe!* Rio Grande, 200 ft.; Bath; *Harris!* near Morant Bay, *Fauckett!* *Fl. Jam.* 6029, 8247.—West Indies, tropics in America, Africa and Asia.

Stem 1-3 ft. high. Leaves 2-10 cm. l. Spikes 2-12 cm. l. Flowers rose-coloured, fading to white, about 75 cm. l. Perianth-leaves thin, transparent.

2. *C. nitida* Vahl *Symb. ii.* 44 (1791); stem shrubby; leaves deltoid, ovate to lanceolate; spikes short and dense or elongated and lax; flowers yellowish-white; style trifid.—*Griseb. loc. cit.*; *Urb. loc. cit.* *C. paniculata* *Moq. tom. cit.* 240 (1849). *Amarantus fruticosus* &c. *Sloane Cat.* 48 & *Hist. i.* 142, *t.* 91, *f.* 1.

Rio Cobre, near Spanish Town, *Sloane Herb. ii.* 109! *Browne!* *Broughton!* Rock Fort, *Campbell!* Palisadoes; near Alligator Pond, 300 ft.; Great Goat Is.; Long Acre Point, west of Black River; between Portland Point and Rocky Point; *Harris!* *Fl. Jam.* 5715, 6754, 7233, 9303, 9870, 10,194.—Florida, Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, Antigua, Guadeloupe, Martinique, Mexico, Central America, Calif. peninsula.

A straggling shrubby plant. Leaves 2-5 cm. l. Spikes 2-7 cm. l. Flowers .5 cm. l. Perianth-segments tough, striated. The specimen of this plant from Browne in Linnaeus's Herbarium is labelled by Linnaeus *Celosia paniculata*. The *C. paniculata* L. of *Sp. Pl.* (1753) is *Iresine paniculata* Kuntze, of the second edition *Chamissoa altissima* H. B. & K.

## 2. CHAMISSOA H. B. & K.

Climbing shrub. Leaves alternate. Flowers hermaphrodite, with persistent bracts in paniculate spikes, white or greenish. Perianth scarious. Stamens 5, united below into a cup; anthers 2-celled; staminodes none. Ovary with 1 ovule, erect with short stalk. Utricle circumsciss. Seed erect, testa crustaceous.

Species 4, natives of tropical America and subtropical South America.

*C. altissima* H. B. & K. *Nor. Gen. & Sp. ii.* 197, *t.* 125 (1818); *Wright Mem.* 257; *Moq. in DC. Prodr. xiii. pt. 2*, 250; *Griseb. Fl. Br. W. Ind.* 62; *Urb. Symb. Ant. iv.* 218. *Blitum album majus scandens* *Sloane Cat.* 49 & *Hist. i.* 142, *t.* 91, *fig.* 2. *Achyranthes altissima* *Jacq. Enum.* 17 (1760); *Sw. Fl. Ind. Occ.* 522. *Celosia paniculata* L. *Sp. Pl. ed. 2*, 298 (1762) (non *ed. 1*, 206). (Fig. 39.)

### Basket With.

Near Spanish Town, *Sloane Herb. ii.* 117! *Houstoun!* *Wright!* *Broughton!* *Shakspear!* *Distin!* *McNab!* *Lane!* St. Mary, *Hartweg!* *Moneague,*

Prior! March! Ball! near Newcastle, J.P. 1058 Hart! August Town, Campbell! Hope; near Browns Town; Mt. Diabolo; Harris! Fl. Jam. 6372, 6971, 7079, 8506.—Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, Saba, Martinique, Grenada, Trinidad, tropical continental America.

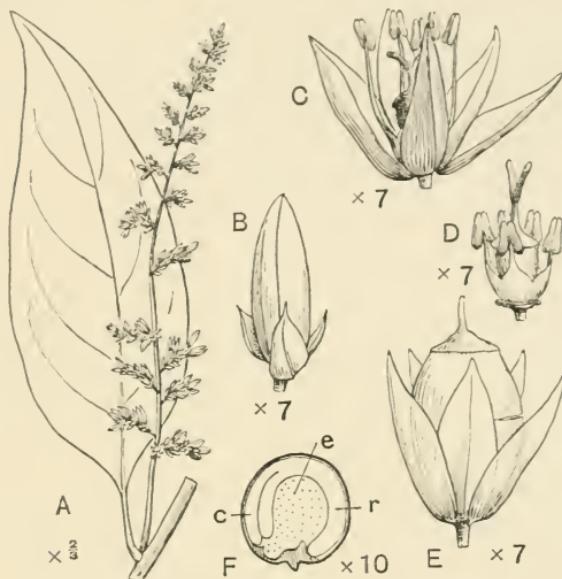


Fig. 39.—*Chamissoa altissima* H. B. & F.

A, Inflorescence and leaf.

B, Flower-bud with bract and bracteoles.

C, Flower.

F, Seed cut lengthwise; c, cotyledons; r, radicle; e, endosperm.

D, Flower with short stamens, perianth removed.

E, Fruit.

Stems split for hoops and baskets. The young tops are boiled for greens.

Shrub, with herbaceous branches, climbing through trees, sometimes 20 ft. high. Leaves glabrous, elliptical to lanceolate, to 9 cm. l., petiole to 2.5 cm. l. Inflorescence lax-flowered or dense-flowered. Bract and bracteoles 1.5 mm. l., keeled. Perianth 3 mm. l., more or less keeled. Stamens shorter than, or as long as, the perianth. Seed enveloped with a transparent aril.

### 3. AMARANTUS L.

Annual herbs. Leaves alternate, long-stalked. Flowers monoecious, small, in axillary clusters or spikes, and sometimes with a long terminal spike. Perianth-segments 5-3, ovate, oblong, linear, lanceolate or subulate. Stamens 2-5, free; anthers 2-celled; staminodes none. Ovary compressed; style short or wanting, stigmas 2-3, filiform or subulate; ovule 1, erect, with short stalk. Utricle compressed, indehiscent or circumsciss, tip entire or 2-3-toothed. Seed lenticular, testa

crustaceous, deep brown to black. Embryo annular, cotyledons linear.

Species, about 45 enumerated, widespread over the whole world except in polar regions.

Plant spiny..... 1. *A. spinosus*.

Plants without spines.

Flowers in a terminal spike, generally long and branched and in axillary spikes or clusters.

Perianth-segments 5. Utricle smooth, circumsciss. 2. *A. tristis*.

Perianth-segments 3. Utricle wrinkled, indehiscent..... 3. *A. viridis*.

Flowers in clusters or very short spikes.

Peduncles of clusters thick, and deciduous with fruit..... 4. *A. crassipes*.

Peduncles wanting. Female perianth with urceolate tube, thick..... 5. *A. polygonoides*.

1. *A. spinosus* L. Sp. Pl. 991 (1753); leaf-axils with spines.—*Wright Mem.* 299; *Moq. in DC. Prodr.* xiii. pt. 2, 260; *Griseb. Fl. Br. W. Ind.* 68; *Wight Ic. t.* 513; *Urb. Symb. Ant.* iv. 218. *Blitum Americanum spinosum Sloane Cat.* 49 & *Hist. i.* 143. Type in *Herb. Linn.*

Prickly Calalu, Spinach.

By way-sides everywhere and in cane-piece intervals, *Sloane Herb.* ii. 112! *Wright!* *Broughton!* *Shakspear!* *Parnell!* river courses, Fort Stewart, *Metcalfe!* *Moneague, Prior!* *Ball!*—Bermuda (introd.), Bahamas, West Indies, continental America, trop. Africa and Asia.

Stem 3-6 dm. high, red and prickly. Spines of the flowering shoots 5-1 cm. l. Leaves of the flowering shoots ovate to rhomboid-lanceolate or lanceolate, light green, to 5.5 cm. l., to 3 cm. br. Flowers white or brown, in axillary globose clusters, and generally also in long terminal spikes. Bract and bracteoles subulate, bristle-like, equalling or exceeding the perianth. Perianth 1.5 mm. l.; segments 5. Stamens 5. Utricle 1.5 mm. l., bursting irregularly above the base, apex 2-3-fid. Seed 8 mm. br.

In common use for greens, and by some preferred to the true spinach.

2. *A. tristis* L. Sp. Pl. 989 (1753); terminal spike with few branches, long and flexuose, axillary spikes smaller; perianth-segments 5; stamens 5 (4 or 3); utricle smooth; circumsciss.—*Willd. Amarant. t. 5, f. 10*; *Moq. loc. cit.*; *Griseb. op. cit.* 69; *Urb. loc. cit.*

Spanish Calalu.

*Broughton!* *Shakspear!* *Distin!* *March!* *Hope, Harris!* Fl. Jam. 6802.—Cayman, Bahamas, W. Indies, tropical and subtropical regions.

Stem to 4 dm. high. Leaves rhomboid-ovate to ovate, obtuse, sub-emarginate, to 5 cm. l., to 3 cm. br., long-stalked. Bracts about as long as the perianth, acute. Perianth 2 mm. l., segments oblong, obtuse, mucronulate. Utricle as long as the perianth, apex 2-3-fid, circumsciss at middle. Seed 1 mm. l., .75 mm. br.

There is no specimen in Linnaeus's Herbarium. *A. gangeticus* L., to which *A. tristis* is doubtfully referred (Flora of British India iv. 719), has 3 long-awned perianth-segments, much longer than the utricle.

[*A. paniculatus* L. (Bleeding Hearts), found in gardens, is allied to *A. tristis* L. The blood-red or reddish-green terminal panicle of flowers is rough with the projecting bracts. The plant, cut young, makes excellent greens, the young stems are as good as asparagus. *A. sanguineus* L., *Wright Mem.* 298.]

3. *A. viridis* L. *Sp. Pl. ed. 2*, 1405 (1763); terminal spike with few branches, long and flexuose, with the clusters sometimes distant, axillary spikes long or short or reduced to clusters; perianth-segments 3; stamens 2 or 3; utricle rough with wrinkles,

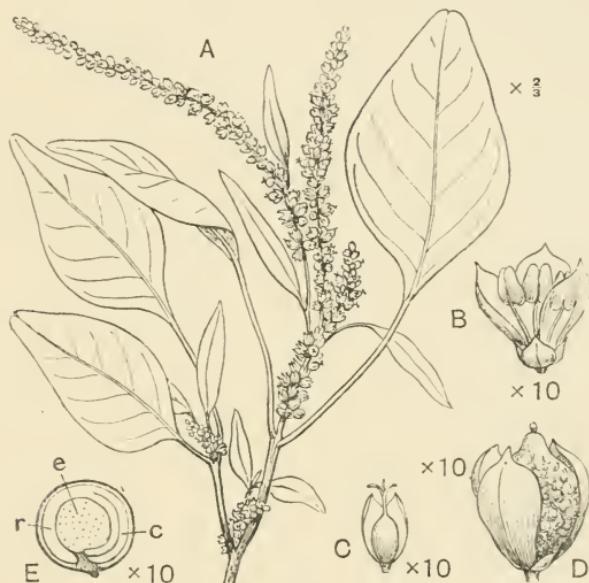


Fig. 40.—*Amarantus viridis* L.

A, Portion of plant in flower.

B, Male flower.

C, Female flower with one perianth-segment removed.

D, Fruit with persistent perianth.

E, Seed cut lengthwise; c, cotyledons; r, radicle; e, endosperm.

acute with the style, indehiscent.—*Wright Mem.* 298. *A. gracilis* Desf. *Tabl.* 43 (1804); *Urb. op. cit.* 219. *Blitum minus album polyspermum* &c. *Sloane Cat.* 49 & *Hist. i.* 143, *t.* 92, *f.* 1. *Euxolus caudatus* Moq. *tom. cit.* 274: *Griseb. loc. cit.* Type in *Herb. Linn.* (Fig. 40.)

Common Garden Calalu, Green Calalu, Spinach.

*Sloane Herb.* ii. 114 and ic. 115! *Wright!* *Broughton!* *March!* *Arcadia, Mrs. Sewell!*—Bahamas, Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, St. Martin, St. Eustatius, Guadeloupe, Dominica, Martinique, St. Vincent, Bequia, Curaçao, tropics.

Leaves ovate-rhomboid, ovate or elliptical, apex rounded or notched, 3-5 cm. l., long-stalked. Bract and bracteoles shorter than the perianth

and utricle. *Perianth*, male, 1·25 mm. l., segments somewhat obovate-elliptical, mucronulate; female 8-·9 mm. l., segments unequal, elliptical, mucronulate in fruit, outer elliptical, the others spathulate. *Utricle* (incl. style) 1·5 mm. l., somewhat fleshy. *Seed* 1·1 mm. in diam.

A. *Blitum* L., with the var. *oleracea* Hook. f. (*A. oleraceus* L.), probably also occurs in Jamaica, although we have no specimen before us. It differs from *A. viridis* L. chiefly in the utricle which is not rugose.—*Euxolus viridis* Moq. *tom. cit.* 273; *Griseb. loc. cit.*

4. *A. crassipes* Schlecht. in *Linnæa vi.* 757 (1831); flowers, male, a few together in the axils of the upper leaves, female several together in axils, with short thick peduncles deciduous with the fruit.—*Urb. loc. cit.* *Scleropus amarantoides* Schrad. in *Ind. Sem. Hort. Gotting.* (1835) (reprinted in *Linnæa xi.* Litt. 89); *Griseb. op. cit.* 68. *S. crassipes* Moq. *tom. cit.* 271 (1849).

March! Hope, 600-700 ft., Harris! Fl. Jam. 6800, 6847.—Florida, Key West, Bahamas, Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, Margarita, Aruba, Curaçao, continental America from Mexico to Peru.

Stem 1-7 dm. l. Leaves 1-2·5 cm. l., spathulate, long-stalked. *Bract* and *bracteoles* keeled, shorter than the perianth. *Perianth* 1·2-1·5 mm. l.; segments 5, male oblong, female spathulate. *Stamens* 3. *Utricle* somewhat fleshy, indehiscent, apex 2-fid, tubercled.

5. *A. polygonoides* L. *Amen. v.* 409 (1760); flowers in axillary sessile clusters; female perianth thick, 5-fid, tube urceolate; *L. Sp. Pl. ed. 2*, 1405; *Urb. loc. cit.* *Blitum polygonoides* *Sloane Cat.* 49 & *Hist. i.* 144, *t.* 92, *fig. 2.* *Chenopodium humile* *multiflorum* &c. *Browne Hist. Jam.* 184. *Amblögyna polygonoides* Moq. *tom. cit.* 270; *Griseb. loc. cit.* Type in *Herb. Mus. Brit.*

Spanish Town, *Sloane Herb. ii.* 116! Kingston, *Browne*; *Wright*! *Macfadyen*! Kingston, *Prior*!—Florida and Keys, Bahamas, Cuba, Hispaniola, St. Thomas, St. Cruz, St. Martin, St. Bartholomew, Saba, Antigua, Bequia, Désirade, Aruba, Curaçao.

Stem decumbent or ascending to suberect, puberulous, to 3 dm. l. Leaves obovate, long-stalked, apex emarginate, the median nerve at the back ending in a mucro, 5-2·5 cm. l. *Bract* and *bracteoles* subulate, nearly as long as the female perianth. *Flowers* white. *Perianth* of male fl. of 3 segments, about 1 mm. l. *Stamens* 3. *Perianth* of female flower 2 mm. l. *Utricle* indehiscent, apex 3-fid, enveloped by the persistent perianth, 3 mm. l.; lobes with 3 nerves slightly prominulous, base fleshy.

#### 4. ACNIDA L.

Annual herbs, tall, glabrous, branching. Leaves alternate, stalked, entire, pinninerved. Flowers in clusters in terminal and axillary spikes, dioecious, male and female dissimilar; bracts and bracteoles shorter than perianth. Male flower: perianth-segments 5, scarious, mucronate. *Stamens* 5, free; anthers 2-celled. Female flower without perianth, enveloped by the persistent bract and bracteoles. Ovary with 2-5 stigmas; ovule 1,

erect, with short stalk. Utricle indehiscent. Embryo annular; cotyledons linear.

Water Hemp.

Species 3 or 4, natives of eastern N. America and West Indies.

*A. cuspidata* Bert. ex Spreng. *Syst. iii.* 903 (1826). *A. australis* A. Gray in *Am. Natural.* x. 489 (1876). *A. cannabina* Griseb. *Fl. Br. W. Ind.* 60 (1859) (non L.). (Fig. 41.)

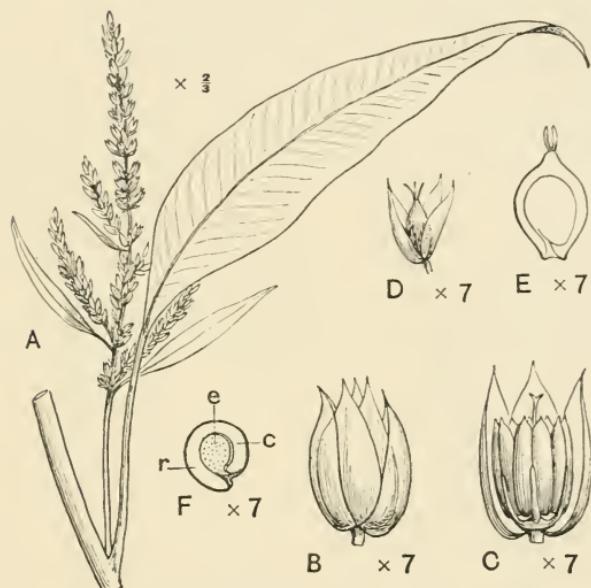


Fig. 41.—*Aenida cuspidata* Bert.

A, Portion of plant.

B, Male flower.

C, Ditto, with two perianth-segments removed.

D, Female flower with bract and bracteoles.

E, Fruit indicating outline of seed.

F, Seed cut lengthwise; c, cotyledon; r, radicle; e, endosperm.

Banks of Ferry River; marsh near Black River; Harris! Fl. Jam. 9047, 9760.—Florida, Trinidad.

Stem 1-2 m. high, the lower part of the main stem very much swollen, to 2.5 dm. br. Leaves lanceolate, 1-2 dm. l. to 5 cm. br. Spikes paniculate, lax, drooping at the top. Male perianth 2.5 mm. l. Female flower, stigmas generally three. Utricle 2 mm. l., with 3 acute angles, glabrous, scarcely exceeding the bracts.

## 5. CYATHULA Lour.

Herbs, sometimes shrubby at base. Leaves opposite, stalked, entire. Flowers clustered, clusters spicate, perfect flowers 1-3 in each cluster, surrounded by others imperfect, reduced to perianth-segments with rigid, hooked awns (glochidia). Perianth

scarious, with long, fine hairs; segments 5, mucronate, or with hooked awns. Stamens 5, united below with staminodes into a cup; anthers 2-celled. Ovary with a filiform style and terminal stigma; ovule 1, pendulous from a long basal stalk. Utricle indehiscent; embryo annular, cotyledons oblong-elliptical.

Species 10, natives of the warmer regions of S. America, West Indies, Africa and Asia.

Leaves obovate-rhomboid or elliptical. Glochidia scarcely longer than the fruiting perianth ..... 1. *C. prostrata*.

Leaves ovate-elliptical, long acuminate. Glochidia generally nearly twice as long as the fruiting perianth ..... 2. *C. achyranthoides*.

1. *C. prostrata* Bl. *Bijdr.* 549 (1825); leaves obovate-rhomboid or elliptical, attenuated at base and shortly acuminate or

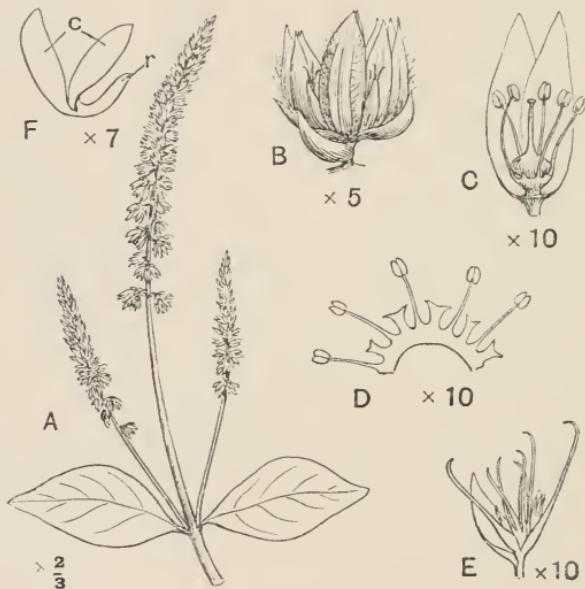


Fig. 42.—*Cyathula prostrata* Bl.

A, Inflorescence and leaves.

D, Staminal cup opened out.

B, Cluster of flowers.

E, Imperfect flowers.

C, Flower with three perianth-segments removed.

F, Embryo of *C. achyranthoides*; c, cotyledons; r, radicle.

obtuse at apex; glochidia yellowish, numerous, scarcely as long as the fruiting perianth.—*Moq. in DC. Prodr. xiii. pt. 2, 326; Griseb. Fl. Br. W. Ind. 63 (in part). Seub. in Fl. Bras. v. pt. 1, 230.* *Achyranthes prostrata* L. *Sp. Pl. ed. 2, 296 (1762).* *Desmochaeta prostrata* DC. *Cat. Hort. Monspel.* 102 (1813); *Wight Ic.* 733. Type in *Herb. Linn.* (Fig. 42.)

A roadside weed. *March!* *Prior!* Spring Hill, Portland, 2200 ft.; Castleton, 500 ft.; *Harris!* Fl. Jam. 6717, 8638.—St. Vincent, Trinidad, tropical S. America, tropics of the Old World.

*Stem* to 9 dm. *Leaves* to 6 cm. l. to 3.5 cm. br. *Spikes* (incl. peduncle) 5-15 cm. l. *Perianth* 2.5 mm. l.

2. *C. achyranthoides* Moq. in *DC. Prodr. xiii. pt. 2*, 326 (1849): leaves ovate-elliptical, attenuated at base, long acuminate at apex; glochidia reddish, often about twice as long as the fruiting perianth.—*Seub. op. cit.* 231. *C. prostrata* Griseb. *loc. cit.* (in part). *Desmochæta achyranthoides* H. B. & K. *Nov. Gen. & Sp. ii.* 210 (1818).

A roadside weed; St. Mary, *McNab!* near Gordon Town, 900 ft., *Moore!* near Darliston, 700 ft., *Harris!* Fl. Jam. 9931.—Dominica, Panama, Colombia, B. Guiana, Brazil, Peru.

*Stem* to 6 dm. high. *Leaves* to 11 cm. l. to 4.5 cm. br. *Spikes* (incl. peduncle) 5-18 cm. l. *Perianth* 2.5-3 mm. l.

## 6. ACHYRANTHES L.

Herbs, sometimes shrubby at base. Leaves opposite, entire. Flowers soon deflexed, in slender spikes; bracts and bracteoles

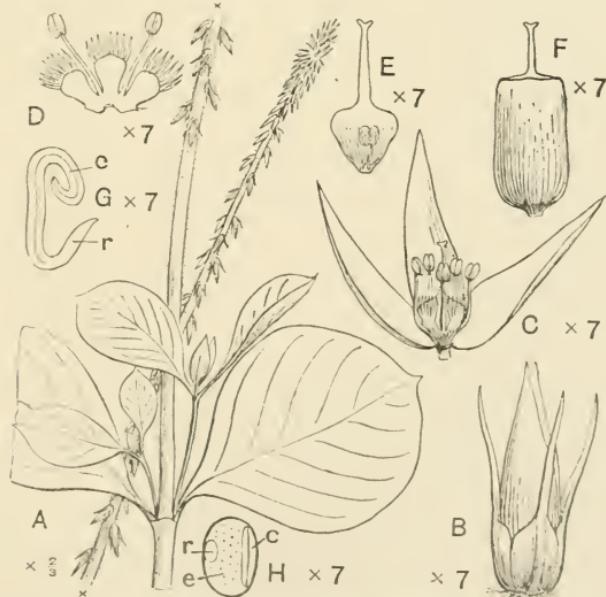


Fig. 43.—*Achyranthes indica* Mill.

A, Part of plant.  
 B, Flower with bract and bracteoles.  
 C, Flower with two perianth-segments removed.  
 D, Portion of staminal tube with 2 stamens and 3 staminodes.  
 E, Ovary with ovule.  
 F, Utricle.  
 G, Embryo; c, cotyledons; r, radicle; e, endosperm.

spinescent. Perianth-segments 5, shortly spinescent, at length hardened and ribbed. Stamens 5, connate at the base with lamellate staminodes broader above, fringed on the back below the apex: anthers 2-celled. Ovary with a slender style and terminal stigma; ovule 1, at apex of a long basal stalk. Utricle indehiscent, oblong or ovoid; embryo surrounding the endosperm; cotyledons linear-lanceolate, flat, infolded at apex.

Species 12, natives of warm and tropical regions.

Leaves obovate-roundish ..... 1. *A. indica*.  
 Leaves lanceolate or elliptical, attenuated at both ends,  
 acuminate ..... 2. *A. aspera*.

1. *A. indica* Mill. *Dict.* (1768) & *Ic. t.* 11, *f.* 2; leaves obovate-roundish, base abruptly narrowing, apex rounded, apiculate, pubescent.—*A. aspera* L. var. *indica* L. *Sp. Pl.* 204 (1753). *A. obtusifolia* Lam. *Encyc. i.* 545 (1785); *Urb. Symb. Ant.* iv. 219. *A. aspera* Moq. in *DC. Prodr. xiii. pt. 2*, 314 (1849); *Wight Ic. t.* 1777. *A. aspera* L. var. *obtusifolia* Griseb. *Fl. Br. W. Ind.* 62 (1859). *Amaranthus spicatus* dictamni &c. *Pluk. Alm.* 26, *t.* 10, *f.* 4. Type in *Herb. Mus. Brit. (Herm. Fl. Zeyl.)*. (Fig. 43.)

*Wilson!* Kingston, *Prior!* Ginger Piece, Blue Mts., J.P. 1420, *Hart!* near Kingston, *Campbell!* Hope, 700 ft., *Harris!* Fl. Jam. 6484, 6869.—West Indies, warmer regions of the world.

A weed, to 1 m. high. *Leaves* 3-7.5 cm. l., 2-7 cm. br. *Spike* to 3 dm. l., woolly. *Bract* 3 mm. l. *Perianth* 4 mm. l. *Stamens* 1 mm. l.; *staminodes* .5 mm. l. *Ovary* .5 mm. l.; *style* 1 mm. l.

2. *A. aspera* L. *Sp. Pl.* 204 (1753); leaves lanceolate or elliptical, narrowing at both ends, acuminate, on upper surface pubescent, beneath sericeous.—*Urb. tom. cit.* 220. *A. caule geniculato* &c. *Browne Hist. Jam.* 180. *A. argentea* Lam. *Encyc. i.* 545 (1785); Moq. *op. cit.* 315 (with var. *virgata*). *A. aspera* L. var. *argentea* Griseb. *loc. cit.* Type in *Herb. Linn.*

“*Crescence*,” *Browne*; *Broughton!* *Shakspear!*—Key West, Cuba, Hispaniola, Porto Rico, Guadeloupe, Martinique, St. Vincent, Nicaragua, Africa, S. Europe, tropical Asia to Japan.

*Leaves* 4-9 cm. l., 1.5-3.5 cm. br. *Bract* about 4 mm. l., limb about 1.5 mm. l. *Perianth* 6 mm. l. *Stamens* 2.5 mm. l., *staminodes* 1.5 mm. l. *Ovary* about 1 mm. l., *style* about 1 mm. l.

## 7. FRÆLICHIA Mœnch.

Herbs. Leaves opposite. Flowers hermaphrodite, in spikes, enclosed by membranous bracts. Perianth woolly, tubular, 5-lobed, tube becoming hard and crested in the fruit. Stamens united into a tube divided at the apex into 5 lobes; anthers

1-celled, sessile on the tube between the lobes. Ovary with 1 ovule pendulous from a long stalk. Utricle enclosed by the perianth-tube, indehiscent. Seed with annular embryo.

Species about 10, natives of warmer regions of America from Texas to southern Brazil, including West Indies.

**F. interrupta** Moq. in DC. Prodr. xiii. pt. 2, 421 (1849); Griseb. Fl. Br. W. Ind. 63 (excl. syn. *F. floridana*). Gomphrena

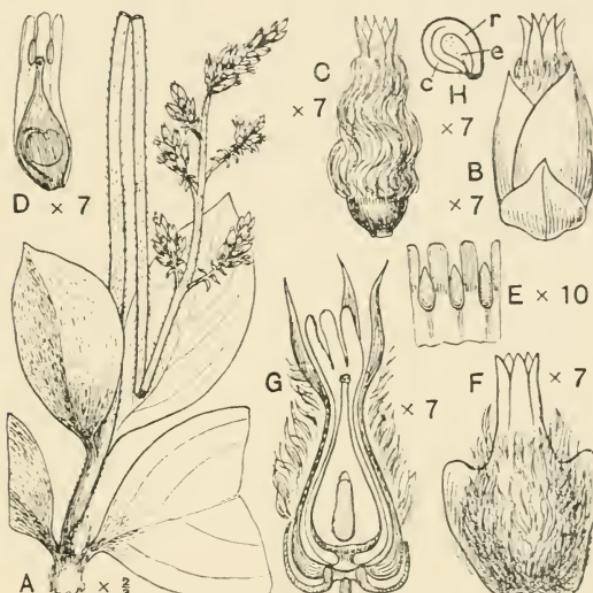


Fig. 44.—*Frælichia interrupta* Moq.

A, Portion of plant.

B, Flower surrounded by the bract and bracteoles.

C, Flower without the bract and bracteoles.

D, Flower without the perianth.

E, Portion of the staminal tube with anthers.

F, Fruit.

G, Ditto, cut lengthwise.

H, Embryo; *c*, cotyledons; *r*, radicle; *e*, endosperm.

*interrupta* L. Sp. Pl. 224 (1753); L'Hér. Stirp. i. 5, t. 3; Nutt. Gen. Am. ii. 79 (1818) (under *Oplotheca*); *Celosia procumbens* Jacq. Misc. ii. 344 (1781) & Ic. Rar. t. 51. (Fig. 44.)

Wright! Shakspear! St. Andrew; Kingston; McNab! Kingston, Prior! Admiral's Pen, Kingston, Campbell! Long Mt. road, Harris! Fl. Jam. 11,234.—Hispaniola, Mexico, Venezuela, Peru.

Stem to 3 dm. high. Leaves, radical elliptical, obtuse, 5 cm. l., 3 cm. br., cauline narrowly elliptical or oblong, 2-4 cm. l., nearly 2-1 cm. br. Fruiting perianth about 5 cm. l., lobes linear-lanceolate; crests 2, narrow. Stamens shorter than perianth.

## 8. ALTERNANTHERA Forsk.

Herbs, often somewhat woody below, usually prostrate or decumbent. Leaves opposite. Flowers small, hermaphrodite, capitate. Heads sessile (in Jamaican species), axillary, solitary, or 2 or 3 clustered. Bract flat, shorter than exterior lateral perianth-segments, bracteoles concave. Perianth with 5 unequal segments, two exterior flattened, median flattened, shorter, two lateral interior concave, still shorter. Stamens 3-5; filaments united into a short cup at base, with alternating staminodes: anthers 1-celled. Ovary with one ovule pendulous at the end of a long stalk. Utricle compressed, roundish to obovate. Seed with annular embryo.

Species 70, natives of tropics and subtropics, especially of America.

Leaves of a pair very unequal.

- Leaves obovate-rhombose, unequal-sided. Exterior perianth-segments villose at base only or glabrate ..... 1. *A. repens*.
- Leaves mostly elliptical, equal-sided. Exterior perianth-segments villose ..... 2. *A. parvifolia*.
- Leaves of a pair, more or less equal.
- Perianth mucronate or spiny ..... 3. *A. ficoidea*.
- Perianth not mucronate nor spiny, though sometimes slightly mucronulate.
- Perianth 2 mm. l., exterior segments 1-ribbed, glabrous. Utricle longer than perianth ..... 4. *A. sessilis*.
- Perianth 4 mm. l., exterior segments 3-ribbed and hirsute below ..... 5. *A. paronychioides*.

1. *A. repens* Kuntze *Rev. ii.* 540 (1891); leaves obovate-rhombose or obovate-elliptical, unequal-sided, obtuse, one of a pair larger than the other; two exterior segments of perianth strongly acuminate-spiny, with three strong nerves, and short hairs near base or glabrate; hairs minutely barbed at apex.—*Urb. Symb. Ant. iv.* 221 (in part). *A. Achyrantha* *Mog. in DC. Prodr. xiii. pt. 2*, 358 (1849); *Griseb. Fl. Br. W. Ind.* 67 (in part). *Achyranthes repens* *L. Sp. Pl.* 205 (1753). *Illecebrum Achyrantha* *L. Sp. Pl. ed. 2*, 299 (1762).

A prostrate weed on sides of streets, Spanish Town, *Harris & Britton!* *Fl. Jam.* 10,517.—Florida, Central and S. America, west trop. Africa.

Stem pubescent-villose. Leaves mucronate, with a few hairs near the base or glabrate, larger 1.5-2.5 cm. l., 1-1.5 cm. br., smaller 0.7-0.8 cm. l. Heads 7-12 mm. l. Bracts glabrous, lanceolate with spiny apex, a little shorter than exterior perianth-segments and a little longer than bracteoles. Flowers straw-coloured. Perianth-segments, two exterior 4.5 mm. l., lanceolate, median elliptical, obtuse, mucronate, with short hairs below, about 3 mm. l.; interior 2.5 mm. l., bearded just above the middle but not to the apex. Stamens 5, about 1 mm. l.; staminodes in form of short teeth; cup 0.25 mm. l. Utricle 1.5 mm. l., roundish, somewhat truncate at apex. Seed 1.3 mm. l., round, compressed.

2. *A. parvifolia* sp. nov.; leaves elliptical, attenuated into the stalk, obtuse, one of a pair larger than the other; two exterior segments of perianth acuminate-spiny, three-nerved, villose from base to above the middle; hairs minutely barbed at apex.—*A. Achyrantha R. Br. var parvifolia Moq. tom. cit. 359 (1849).* *A. repens Urb. loc. cit. (1905) (in part).* *A. Achyrantha Griseb. loc. cit. (1859) (in part).* (Fig. 45.)

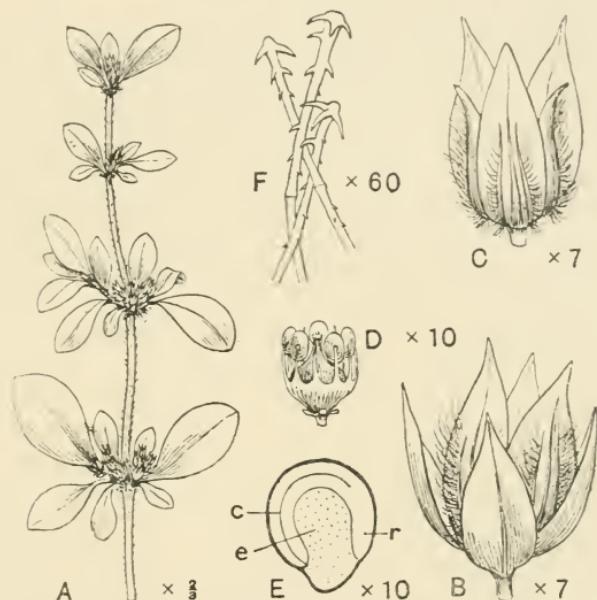


Fig. 45.—*Alternanthera parvifolia* Fawc. & Rendle.

A, Portion of plant.

B, Flower with bract and bracteoles.

C, Flower.

D, Flower with perianth removed.

E, Seed cut lengthwise; *c*, cotyledons; *r*, radicle; *e*, endosperm.

F, Hairs from perianth.

Wright! Cinchona, 5000 ft., Fawcett! Fl. Jam. 6007.—Cuba, Hispaniola, Porto Rico, St. Cruz, St. Vincent, Barbados, trop. and subtrop. America, Azores, Madeira, Canary Is., Spain.

Stem pubescent, villose. Leaves, larger 1.2 to nearly 2 cm. l., 6-8 cm. br., smaller 6-7 cm. l., mucronate, with a few hairs or glabrate. Heads 7-9 mm. l. Bract glabrous, ovate, with spiny apex,  $\frac{2}{3}$  length of exterior lateral perianth-segments, and equal to or shorter than bracteoles; bracteoles with a few hairs. Flowers straw-coloured. Perianth-segments very unequal, two exterior 3.5 mm. l., elliptical-lanceolate; median oblong-lanceolate, acute, shorter, villose near base; interior 2.3 mm. l., bearded at the base and from the middle upwards. Stamens 5, about 1 mm. l.; staminodes nearly as long, triangular-acuminate; cup about 3 mm. l. Pistil (incl. style) as long as stamens, broader above. Utricle 1.8 mm. l. Seed about 1.3 mm. l., ovate-roundish, somewhat compressed, reddish-brown.

3. *A. ficoidea* *Roem. & Schult.* *Syst. v.* 555 (1819); leaves elliptical, attenuated at both ends, somewhat acute; two exterior segments of perianth acuminate-cuspidate, 3-ribbed, more or less hirtellous and brownish.—*Urb. loc. cit.* *A. polygonoides* *Griseb.* *loc. cit.* (1859). *Gomphrena ficoidea* *L. Sp. Pl.* 225 (1753). *Illecebrum ficoideum* *L. Sp. Pl. ed. 2,* 300 (1762). *Gomphrena repens* &c. *Browne Hist. Jam.* 184. *Telanthera ficoidea* *Moq. tom. cit.* 363 (1849). Type in *Herb. Linn.*

Crab With, Rupture Wort.

Rock River, *Browne*; *Shakspear!* Moneague, *Prior!* J.P. 632; Catherine Peak, J.P. 1441, *Hart!* Kingston; between Kingston and Morant Bay; *Fawcett!* Hope, 600 ft.; Grove, St. Andrew, 800 ft.; Black River; between Portland Point and Rocky Point; *Harris!* Fl. Jam. 6044, 6114, 6716, 6801, 6832, 8244, 9856.—West Indies, South America.

*Stem* glabrate, more or less tomentose at apex of branches. *Leaves* 3-7 cm. l., 1-2·3 cm. br., glabrate, the tomentum of the young leaves sometimes partially remaining. *Heads* ·5-1 cm. l. *Bracts* about 2·5 mm. l. *Flowers* straw-coloured. *Perianth*, two exterior segments about 3·5 or 3·6 mm. l.; median 3·1 mm. l., slightly pubescent; interior 3-2·75 mm. l., glabrous. *Stamens* 2·2 mm. l.; staminodes as long, with apex fimbriate. *Pistil* (incl. style and stigma) about 1 mm. l., ovary globose.

Var. *flavogrisea* var. nov.; stems with very dense greyish-yellow adpressed pubescence above, glabrescent below; perianth densely hirtellous nearly to apex.—*Telanthera flavogrisea* *Urb. Symb. Ant. i.* 300 (1899).

Kingston, *Prior!* *Eggers!* seashore, Rockfort, *Campbell!* Kingston, *Fawcett!* Rockfort; coast between Portland Point and Rocky Point; *Harris!* Fl. Jam. 6059 (fide Urban), 6114, 9563, 10,182.

4. *A. sessilis* *Moq. tom. cit.* 357 (1849); leaves elliptical, attenuated at base, obtuse; exterior segments of perianth 2 mm. l., acuminate, strongly one-nerved, glabrous; utricle a little longer than perianth.—*Griseb. loc. cit.*; *Seub. in Fl. Bras. v. pt. 1,* 184, t. 57, f. II.; *Urb. Symb. Ant. iv.* 220. *Gomphrena sessilis* *L. Sp. Pl.* 225 (1753). *Illecebrum sessile* *L. Sp. Pl. ed. 2,* 300 (1762). Type in *Herb. Mus. Brit. (Herm. Fl. Zeyl.)*.

A weed on lawns, Hope Gardens, *Harris & Britton!* Fl. Jam. 10,644.—Hispaniola, Porto Rico, St. Kitts, Antigua, Guadeloupe, Dominica, Martinique, St. Vincent, Tobago, Trinidad, tropics.

*Stem* pubescent in two lines. *Leaves* variable in size, 1-2·5 cm. l., ·8-1·3 cm. br., sometimes larger, glabrous. *Heads* 2-3 mm. l. *Bracts* about 1 mm. l. *Flowers* white. *Perianth-segments* about equal in length, 2 mm. l. *Stamens* 3, perfect, about 1 mm. l.; staminodes as long as stamens, lanceolate-linear; cup almost obsolete. *Pistil* (incl. style) shorter than stamens; ovary broader above. *Utricle* obreniform.

5. *A. paronychioides* *St. Hil. Voy. Brés. ii.* 439 (1833) leaves long-stalked, oblanceolate or lanceolate to elliptical; exterior segments of perianth 4 mm. l., acute or somewhat obtuse, scarcely mucronulate, 3-nerved and hirsute on lower

half; utricle included in the perianth.—*Moq. tom. cit.* 358; *Seub. tom. cit.* 185, t. 56; *Urb. loc. cit.* *A. ficoidea Griseb. loc. cit.* (1859). *Amaranthoides humile curassavicum foliis polygoni Sloane Cat.* 48 & *Hist. i.* 141, t. 86, f. 2. *Herniaria hirsuta* &c. *Browne Hist. Jam.* 104. *Gomphrena polygonoides L. Sp. Pl.* 225 (1753) (with reference only to syn. Sloane). *Illecebrum polygonoides L. Sp. Pl. ed.* 2, 300 (with reference only to syn. Sloane & Browne). *Telanthera polygonoides Moq. tom. cit.* 363 (1849) (excl. some varieties).

Spanish Town, *Sloane* Herb. ii. 106! *Houstoun!* Kingston, *Browne!* *Wright!* *Shakspear!* *Distin!* *McNab!* *Purdie!* in pastures, Newmarket to Darliston, 1150 ft. *Harris!* Fl. Jam. 9869.—Bahamas, Cuba, Is. of Pines, Hispaniola, Porto Rico, St. Thomas, Antigua, Guadeloupe, Martinique, St. Lucia, Barbados, Grenada, Mustique, tropical continental America.

Stems glabrate, more or less woolly at apex of branches, to 6 dm. l. or more. Leaves 1-3 cm. l., 5-1 cm. br., strigose or glabrescent. Heads 5-1 cm. l. Bracts 2 mm. l.; bracteoles slightly longer. Flowers white. Perianth, exterior segments 4.25-4.5 mm. l., slightly brownish below; median, slightly shorter than exterior, hirsute in lower half; interior, about 3.5 mm. l., glabrous. Stamens 5, about 1.2 mm. l.; staminodes shorter than the filaments, dilated, apex toothed; cup very short. Pistil (incl. stigma) 75 mm. l.; ovary broader than long. Utricle about 2 mm. l., bluntly obreniform.

### 9. PHILOXERUS R. Br.

Prostrate herbs. Leaves opposite, entire, narrow. Flowers hermaphrodite, scarious, capitate, with one bract and two bracteoles; heads axillary and terminal. Perianth with 5 segments, thickened at the base, supported by a spongy stalk. Stamens 5, filaments united into a short cup at the base, without alternating staminodes; anthers 1-celled. Ovary with short style and 2 linear stigmas; with one ovule at the end of a long stalk. Utricle compressed, ovoid. Seed with annular embryo.

Species about 10, natives of eastern tropical America, west Africa, Australia, and the Loochoo Islands.

*P. vermicularis* *Beauv. Fl. Ow. & Ben.* ii. 65, t. 98, f. 1 (1807); *Griseb. Fl. Br. W. Ind.* 65; *Urb. Symb. Ant.* iv. 223. *Gomphrena vermicularis L. Sp. Pl.* 224 (1753). *Gomphrena repens rufescens* &c. *Browne Hist. Jam.* 184. *Illecebrum vermiculatum L. Sp. Pl. ed.* 2, 300 (1762). *Iresine vermicularis Moq. in DC. Prodr. xiii. pt. 2,* 340 (1849). Type in Herb. Linn. (Fig. 46.)

Rock-river, *Browne!* *Broughton!* *Macfadyen!* *Parnell!* St. Thomas in the East, *Purdie!* *March!* Montego Bay, *Fawcett!* Pedro Bluff, *Harris!* Fl. Jam. 9813.—Florida, Bahamas, W. Indies, continental tropical America, west Africa.

Perennial sea-shore plant. Stem herbaceous, decumbent, diffuse, with creeping branches, rooting at the nodes, to 5 dm. or more. Leaves linear, glabrous, fleshy, 2-4 cm. l. Flower-heads globose or ellipsoidal, 8-23 mm. l., 7-8 mm. in diam. Bract 2.1 mm. l., 1-nerved; bracteoles 3 mm. l.,

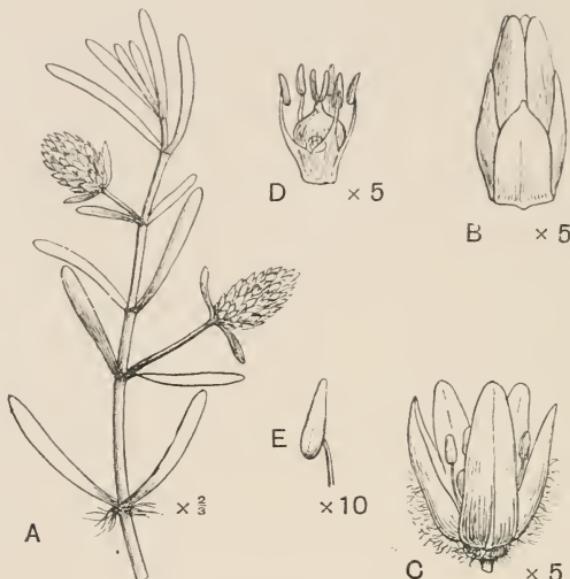


Fig. 46.—*Philoxerus vermicularis* Beauv.

A, Portion of plant.

B, Flower with bract and bracteoles.

C, Flower.

D, Flower with perianth removed.

E, Stamen.

keeled. Perianth about 3 mm. l. (not incl. spongy base), two outer segments 3-nerved, obtuse, third segment 1-nerved, obtuse, a little shorter than the outer; two inner segments 1-nerved, acute, nearly equal to third segment; wool at base of inner segments, but not enveloping perianth.

#### 10. GOMPHRENA L.

Herbs. Leaves opposite, sessile or shortly stalked, entire. Flowers hermaphrodite in heads, with one bract and two bracteoles. Perianth 5-partite, woolly. Staminal tube long, 5-fid; anthers 1-celled, inserted at the apex of the lobes. Stigmas two, linear; ovule one at the end of a long stalk. Utricle compressed, ovoid. Seed with annular embryo.

Species about 90, mostly natives of Central and South America, a few of Australia, one found all over the world.

Stem decumbent. Flower-heads 1-1.5 cm. l. .... 1. *G. decumbens*.  
Stem erect. Flower-heads 2-3 cm. l. .... 2. *G. globosa*.

*G. decumbens* Jacq. *Hort. Schoenbr.* t. 482; stem procumbent; 3 outer perianth-segments woolly at base only, flat, 2 inner lateral concave woolly.—*Moq. in DC. Prodr. xiii. pt. 2, 410.* (Fig. 47.)

Up Park Camp, 240 ft., Harris! Fl. Jam. 11,542.—Is. of Pines, tropical continental America.

*Stem* to  $1\frac{1}{2}$  ft., with ascending branches, woolly, especially when young. *Leaves* 2-3 cm. l., 5-1 cm. br., oblong-elliptical, semi-amplexicaul. *Flower-heads* subglobose, 8-1.5 cm. l., terminal, usually

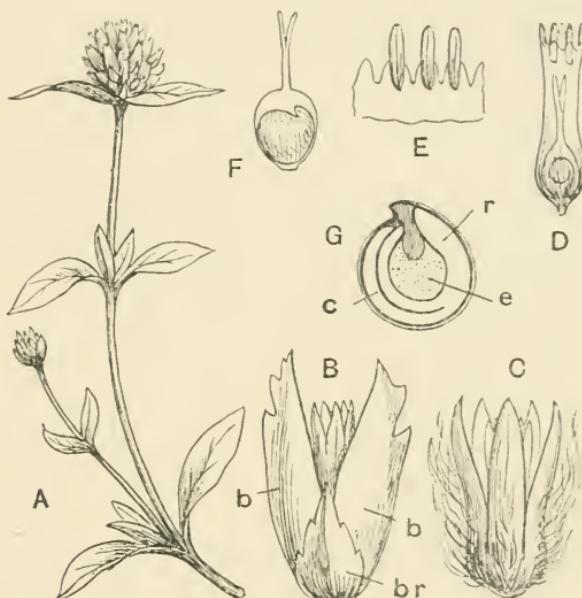


Fig. 47.—*Gomphrena decumbens* Jacq.

A, Flowering branch  $\times \frac{2}{3}$ .

B, Flower enclosed by bract (br) and bracteoles (b)  $\times 7$ .

C, Flower  $\times 7$ .

D, Flower with perianth removed, showing staminal tube through which the pistil is visible  $\times 7$ .

E, Upper portion of staminal tube with 2 stamens removed  $\times 10$ .

F, Utricle and seed  $\times 7$ .

G, Seed in section  $\times 10$ ; e, endosperm; c, cotyledons; r, radicle.

solitary, with 2 (or 3) leaves at the base. *Bract* about 2 mm. l., persistent. *Bracteoles* about 5 mm. l., crested, deciduous with flower. *Flowers* white and pink, enclosed by the bracteoles. *Perianth-segments* 3.6-4 mm. *Staminal tube* about 2.5 mm. l.

*G. globosa* L. *Sp. Pl.* 224 (1753); *Moq. tom. cit* 409; *Griseb. Fl. Br. W. Ind.* 63. *G. erecta* &c. *Browne Hist. Jam.* 184.

#### Bachelor's Buttons.

Naturalised; *Browne*; *Miss Wood*!—Widely naturalised; perhaps a native of America.

An erect annual. Leaves oblong-elliptical, 2-8 cm. l., petioles short, semiamplexicaul. Flower-heads globose, 2-3 cm. l., terminal, usually solitary, with two leaves at the base. Flowers purplish, sometimes rose or silvery-white, 7 mm. l., enclosed by the bracteoles.

### 11. IRESINE L.

Erect herbs. Leaves opposite, entire or serrulate. Flowers minute, polygamous or dioecious, in clusters along the branches of a panicle (in Jamaican species). Perianth with 5 segments, in the female flower encircled by, and at length enveloped in



Fig. 48.—*Iresine elatior* L. C. Rich.

A, Portion of inflorescence and leaf.

C, Flower opened out, and with one

B, Flower with bract and bracteoles.

perianth-segment removed.

D, Fruit cut lengthwise; c, cotyledons; r, radicle; e, endosperm.

wool. Stamens 5; filaments united by a short cup at the base, with or without alternating staminodes; anthers 1-celled. Ovary with 2 stigmas, rarely 3; with one ovule at the end of a long stalk. Utricle compressed-roundish. Seed with annular embryo.

Species about 20, natives of tropical and subtropical America (incl. West Indies) and Africa.

Spikes sessile, golden-yellow or white.....	1. <i>I. paniculata</i> .
Spikes shortly stalked, umber-buff .....	2. <i>I. elatior</i> .

1. *I. paniculata* Kuntze *Rev. ii.* 542 (1891); spikes sessile, golden yellow or white; flowers dicecious.—*Urb. Symb. Ant.* iv. 222. *I. Celosia* L. *Syst. ed.* 10, 1291 (1759). *I. celosioides* L. *Sp. Pl. ed.* 2, 1456 (1763); *Wright Mem.* 268; *Moq. in DC. Prodr.* xiii. *pt. 2*, 347; *Griseb. Fl. Br. W. Ind.* 64. *I. erecta* &c. *Browne Hist. Jam.* 358. *Amaranthus panicula* *flavicante* &c. *Sloane Hist.* i. 142, *t.* 90, *f.* 2. *A. nodosus* &c. *Pluk. Alm.* 26, *t.* 261, *f.* 1. *Celosia paniculata* L. *Sp. Pl.* 206 (1753). Type in Herb. Linn.

Juba's Bush.

*Sloane* *Herb.* ii. 118! *Shakspear!* *Bancroft!* *McNab!* *Montego Bay, Parnell!* *Moneague, Prior!* *March!* *Clydesdale, J.P. 1142, Morris!* *Ball!* *Gordon Town, 1100 ft., Eggers!* *St. George, Cradwick!* *Norbrook, Campbell!* *Mandeville, 2200 ft., Harris!* *Fl. Jam.* 6238, 6270.—*Bahamas, Cayman, West Indies, continental America from United States south to Argentina.*

*Stem* 6-12 dm. l., weak and trailing, or woody below. *Leaves*, upper lanceolate, lower ovate, to 15 cm. l., becoming smaller above, acute or acuminate. *Panicles* 3 dm. l. and longer or much contracted, with no leaves or a few; spikes with pubescent rhachis, 4-7 mm. l. *Bract* and *bracteoles* broadly ovate; bracteoles not keeled, a little longer than the bract and a little shorter than the perianth. *Perianth* 1.1 mm. l., glabrous; segments inconspicuously 3-nerved. *Utricle* 8 mm. l. *Seed* brown-black, 6 mm. br.

2. *I. elatior* L. C. Rich. *ex Willd. Sp. Pl. iv.* 766 (1806); spikes stalked, between umber and buff colour; flowers polygamomonecious.—*Moq. tom. cit.* 343; *Griseb. loc. cit.*; *Urb. loc. cit.* (Fig. 48.)

*Broughton!* *Prior!* *coast between Portland Point and Rocky Point, Harris!* *Fl. Jam.* 10, 187.—*West Indies, Venezuela, Colombia, Panama, Mexico.*

*Stem* to 12 dm. high, trailing, woody below. *Leaves* lanceolate, acuminate, to 15 cm. l., becoming smaller towards the inflorescence. *Panicles* to 3 or 4 dm., leafy below; spikes with woolly rhachis, 4-6 mm. l., or sometimes longer. *Bract* and *bracteoles* mucronate, 1-nerved; bract 1.1 mm. l.; bracteoles keeled, 1.8 mm. l. *Perianth* 1.5 mm. l., villose; exterior segments somewhat obtuse, mucronate, with one green nerve, interior narrower, acute; wool 4-6 mm. l., on perianth and rhachis. *Utricle* 8 mm. l.

FAMILY XVII. NYCTAGINACEÆ.

Herbs, shrubs or trees. Leaves opposite or partly alternate (in *Pisonia*), entire. Flowers in paniculate, corymbiform, terminal and axillary cymes or rarely umbellulate, with a calyx-like involucre (in *Mirabilis*) or minute bracts, hermaphrodite or unisexual by abortion. Perianth inferior, persistent and increasing in size in the fruit, enclosing the pericarp. Stamens 2-10, hypogynous, filaments more or less united at the base, generally

unequal. Ovary 1-celled. Fruit (called an *anthocarp*) consisting of the persistent base of the perianth enclosing and adhering to an indehiscent utricle. Seed erect. Embryo curved or straight; cotyledons large, enclosing the endosperm.

Species 160, natives of warmer regions, especially in America.

Flowers with a calyx-like involucre..... 1. *Mirabilis*.

Flowers with minute bracts.

Herbs with minute flowers..... 2. *Boerhavia*.

Shrubs or trees.

Stamens and stigma exserted ..... 3. *Pisonia*.

Stamens and stigma included..... 4. *Neea*.

### 1. MIRABILIS L.

Herbs. Leaves opposite. Flowers in cymes. Bracts forming a calyx-like involucre, 5-lobed; lobes erect, imbricate, not enlarged after flowering. Perianth with a long tube constricted

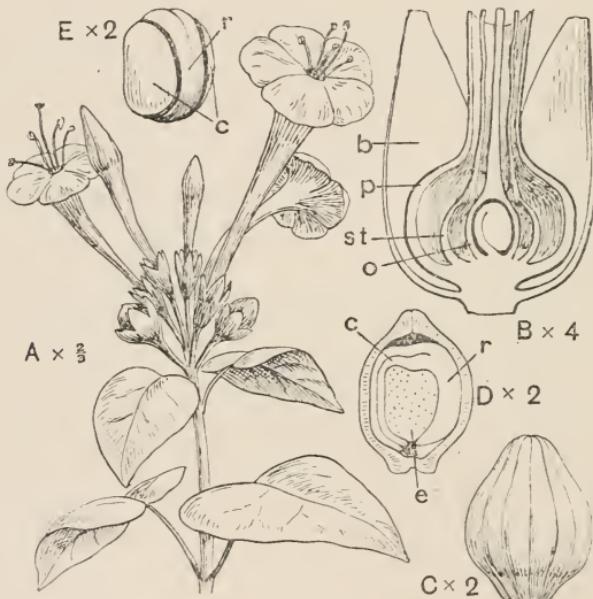


Fig. 49.—*Mirabilis Jalapa* L.

A, Portion of plant.

B, Lower part of flower cut lengthwise; b, bract; p, perianth; st, stamens; o, ovary.

C, Anthocarp.

D, Do. cut lengthwise; c, cotyledons; r, radicle; e, endosperm.

E, Embryo; c, cotyledons; r, radicle.

and deciduous above the ovary; limb spreading, 5-lobed, plicate. Stamens 5-6, unequal in length, exserted, filaments connate at the base into a fleshy cup. Ovary with style exserted; stigma capitellate, covered with stalked papillæ. Anthocarp crustaceous.

Testa of seed adhering to the pericarp. Embryo curved; cotyledons surrounding the floury endosperm; radicle long.

Species 24, natives of tropical America.

*M. Jalapa* L. *Sp. Pl.* 177 (1753); *Wright Mem.* 225; *Choisy in DC. Prodr.* xiii. 2, 427; *Griseb. Fl. Br. W. Ind.* 69; *Heimerl in Engl. Bot. Jahrb.* xxi. 616; *Urb. Symb. Ant.* iv. 224. (Fig. 49.)

Four o'clock, Marvel of Peru.

*Sloane*, fruit coll.! Moneague, *Prior!* Mavis Bank, *Troy, Harris!*—Bahamas, West Indies, continental tropical America. Cult. in tropics.

Stem 1 to 2 ft. Leaves 2-10 cm. l., ovate, acuminate, base sometimes subcordate, long stalked. Flowers 5 cm. l., white, tinted with red, purplish, or yellow with purple lines, in terminal clusters. *Anthocarp* about 1.5 cm. l.

## 2. BOERHAVIA L.

Erect, diffuse or climbing herbs, woody at the base. Leaves opposite. Flowers very small, sessile or subsessile in panicles,

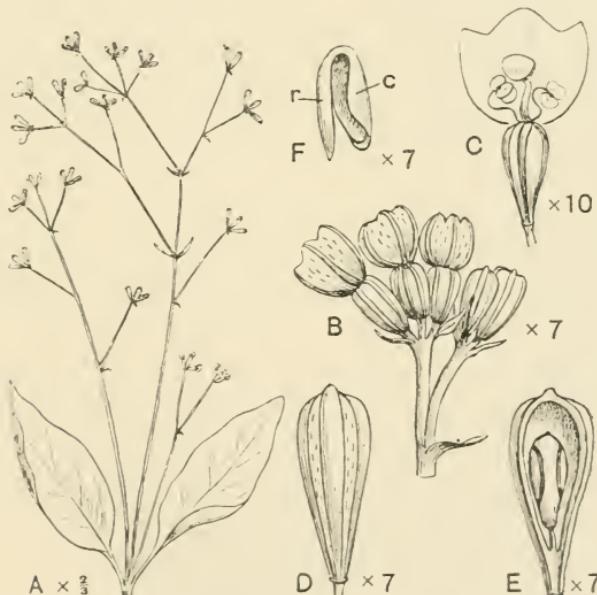


Fig. 50.—*Boerhavia erecta* L.

A, Portion of plant.

B, Portion of inflorescence.

C, Flower with part of the perianth removed.

D, Fruit.

E, Fruit cut lengthwise showing seed.

F, Embryo; c, cotyledon; r, radicle.

or long-stalked in pedunculate umbels, with minute bracts. Perianth constricted above the persistent tube, limb funnel-shaped or campanulate, margin 5-lobed, plicate, deciduous.

Stamens 2 (rarely 3) in Jamaican species, filaments connate at the base. Ovary narrowed to the base; style with peltate stigma. Anthocarp small, ribbed. Seed adhering to the pericarp. Embryo bent on itself. Cotyledons large, flat, folded over the small endosperm at the base of the seed. *Hog Weed*.

Species about 30, widely dispersed through the warmer regions of the world.

Flowers not more than 3 mm. l., sessile or subsessile in panicles.

Flowers rose-coloured. Seed-vessel glabrous..... 1. *B. erecta*.

Flowers blood-red. Seed vessel with glandular hairs.

Seed-vessel oblong-clavate, 4-6 mm. l. .... 2. *B. paniculata*.

Seed-vessel obovoid-clavate, 2.5-4 mm. l. .... 3. *B. hirsuta*.

Flowers 5-7 mm. l., umbellate on a long peduncle ..... 4. *B. scandens*.

1. *B. erecta* *L. Sp. Pl. 3* (1753); herbaceous, stem glabrate or sparsely puberulous, not glutinous; leaves ovate-undulate to lanceolate, apex acute, generally marked with reddish dots, whitish underneath; flowers rose-coloured, subsessile or shortly stalked; fruit club-shaped, glabrous, apex very blunt, angles broad, furrows narrow.—*Wright Mem. 246*; *Choisy in DC. Prodr. xiii. pt. 2, 450*; *Griseb. Fl. Br. W. Ind. 69*; *Heimerl in Engl. Bot. Jahrb. xxi. 617* & in *Engl.-Prantl Nat. Pflzam. iii. pt. 1 b. 22 f. 7 B-D.*; *Urb. Symb. Ant. iv. 224*. Type in *Herb. Linn.* (Fig. 50.)

*Browne!* *Wright!* *Bancroft!* *Macfadyen!* *McNab!* *Parnell!* Spanish Town, *Prior!* a weed, Hope, *Harris!* Fl. Jam. 6777, 6799, 6807, 6853.—Bermuda, Cayman, Bahamas, W. Indies, continental America.

Plant  $\frac{1}{2}$ -2 or 3 ft. high. *Perianth*, permanent base glabrous, 1 mm. l., limb about 2 mm. l. and br. *Anthocarp* 3-4 mm. l.

2. *B. paniculata* *L.C. Rich. in Act. Soc. Hist. Nat. Par. i. 105* (1792); herbaceous; stem often decumbent at the base, glabrate or often puberulous or pubescent, especially at the nodes, here and there glutinous; leaves elliptical to roundish, apex obtuse, margin more or less ciliate, lighter-coloured beneath; flowers blood-red or purplish, sessile; fruit, oblong-clavate, angles narrow, with glandular hairs.—*Choisy loc. cit.*; *Griseb. loc. cit.*; *Schmidt in Fl. Bras. xiv. pt. 2, 369, t. 86*; *Heimerl in Engl. Bot. Jahrb. xxi. 619*; *Urb. loc. cit.* *B. diffusa* *Sw. Obs. Bot. 10* (1791) (non *L.*); *Wright Mem. 246*.

*Sloane* *Herb. iv. ante 26!* *Macfadyen*; *Wilson!* *Lane!* *Oersted!* *March!* *Ball!* a weed, Hope, 600 ft., *Harris!* near Castleton, 400 ft., *Thompson!* Fl. Jam. 6685, 6805, 7960.—Bahamas, West Indies, Central and South America.

Plant  $1\frac{1}{2}$ -3 ft. high. *Perianth*, permanent base 1-1.5 mm. l., limb about 1 mm. l. and br. *Anthocarp* 4-6 mm. l.

3. *B. hirsuta* Willd. *Phytogr.* 1 (1794); herbaceous; stem ascending or diffuse, more or less puberulous and hirsute, especially at the nodes; leaves broadly ovate or subrhomboïd, base rounded, apex obtuse to somewhat acute, margin more or less ciliate, entire or slightly lobed; flowers subsessile, blood-red or purplish; fruit obovoid-clavate, angles narrow, glabrous, intermediate spaces covered with glandular hairs.—*Choisy tom. cit.* 451; *Griseb. loc. cit.*; *Heimerl tom. cit.* 620; *Urb. tom. cit.* 225. *Solanum bacciferum americanum* &c. *Pluk. Alm.* 349, t. 226, f. 7. *Valerianella folio subrotundo* &c. *Sloane Cat.* 91 & *Hist. i.* 210.

*Plukenet* in *Herb. Sloane*, xviii. 51! *Sloane Herb.* iv. 27! *Masson!* *Bancroft!* *Macfadyen!* *McNab!* Falls River, *Prior!* *March!* Sea-side, Dover, *Metcalfe!* *Cinchona*, 5000 ft., *J.P.* 670, *Morris!* Hope, 600 ft., *Harris!* Fl. Jam. 5936.—West Indies as far south as Grenada, Central and South America.

Plant 2 ft. high. *Perianth*, permanent base about 1 mm. l., limb 1·5–2 mm. l. *Anthocarp* 2·5–4 mm. l.

4. *B. scandens* L. *Sp. Pl.* 3 (1753); somewhat shrubby, glabrous; stems erect, diffuse or climbing; leaves cordate to ovate or ovate-lanceolate passing into bracts, entire or slightly repand; flowers in umbels, with long pedicels, yellowish- or whitish-green; fruit oblong-clavate, glabrous or rough with papillæ, longitudinally 10-striate, glutinous with tubercles near the apex secreting a viscid fluid.—*Choisy tom. cit.* 454; *Griseb. loc. cit.*; *Jacq. Hort. Vindob. i.* 2, t. 4; *Heimerl tom. cit.* 621; *Urb. loc. cit.* *Valerianella alsines folio scandens* &c. *Sloane Cat.* 91, *Hist. i.* 210. *Boerhaavia sarmentosa* &c. *Browne Hist. Jam.* 123. Type in *Herb. Mus. Brit.*

Spanish Town (St. Jago de la Vega), *Sloane Herb.* iv. 26, 28! *Houstoun!* *Wright!* *Dancer!* Kingston, *Prior!* *March!* Rock Fort, *Campbell!* Hope; Gordon Town; *Harris!* Fl. Jam. 6194, 6977, 8426.—Bahamas, West Indies as far south as Antigua, Curaçao, continental America from Arizona to Peru.

Plant to 4 ft. high. *Perianth*, permanent base 2–3 mm. l., limb 3–4·5 mm. l., 5 mm. across. *Anthocarp* 8–10 mm. l., 1–2 mm. br.

### 3. PISONIA L.

Trees or shrubs. Leaves opposite or partly alternate. Flowers small, with 2–3 minute bracteoles, in clusters, in stalked, paniculate, corymbiform cymes, dioecious. Perianth 5-toothed, of the male flower, tubular-campanulate to funnel-shaped, of the female flower, oblong-tubular. Male flower: stamens 6–10, filaments unequal, slightly connected at the base, exserted; ovary small, sterile. Female flowers: ovary with slender style

and capitate or multitudinous exserted stigma; stamens short and sterile. Anthocarp indurated or somewhat fleshy on the outside. Utricle elongated or ellipsoidal, membranous. Testa of seed hyaline, adhering to pericarp; embryo straight; cotyledons broad, thin, enclosing endosperm, twisted and plaited or conduplicate.

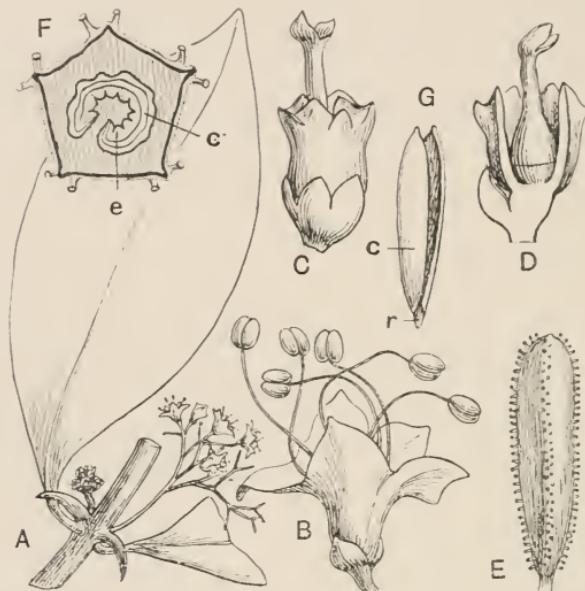


Fig. 51.—*Pisonia aculeata* L.

A, Portion of male flowering branch $\times \frac{1}{2}$ .	E, Fruit $\times 2$ .
B, Male flower $\times 5$ .	F, Fruit cut across $\times 5$ .
C, Female flower $\times 5$ .	G, Embryo.
D, Do. with part of the perianth removed $\times 5$ .	e, endosperm; c, cotyledons; r, radicle.

Species about 30, mostly natives of tropical America, a few indigenous in Asia, Polynesia and Madagascar.

§ 1. Fruit oblong-clavate, 5-angled, with rows of glutinous papillæ along the angles ..... 1. *P. aculeata*.

§ 2. Fruit ellipsoidal, fleshy on the outside, not glandular.

- Leaves leathery, veins densely reticulate, prominulous especially beneath ..... 2. *P. obtusata*.
- Leaves thin, veins indistinct, flat or impressed.
  - Panicle solitary, terminal, erect ..... 3. *P. fragrans*.
  - Panicles or racemes, 2 or more together, axillary ..... 4. *P. discolor*.

§ 1. Anthocarp oblong-clavate or subprismatic, leathery, with rows of glutinous papillæ along the five angles.

1. *P. aculeata* L. *Sp. Pl.* 1026 (1753); *Plum. Pl. Amer.* (*Burm.*) 223, *t.* 227, *f.* 1; *Wright Mem.* 264; *Choisy in DC. Prodr. xiii. pt. 2*, 440; *Griseb. Fl. Br. W. Ind.* 70; *Heimerl in Engl. Bot. Jahrb. xxi.* 631; *Urb. Symb. Ant.* *iv.* 226. *P. nigricans* *Griseb. loc. cit.* (in part) (1859) (non *Sw.*). *Paliuro affinis arbor spinosa* &c. *Sloane Cat.* 137 & *Hist. Jam. ii.* 25, *t.* 167, *f.* 3, 4. (Fig. 51.)

Cocks-pur, Fingrigo.

*Millar* (in fruit coll. *Sloane*)! *Sloane Herb.* *v.* 90! *Houstoun*! *Wright*! *McNab*! *Hartweg*! *Krebs*; *Oersted*; *St. Thomas in Vale*; *Monague*; *Ewarton*; *Prior*! *March*! *King's House*, *J.P.* 1812, *Morris*! near *Gordon Town*, *Fawcett*! near *Ferry*, *Harris*! *Amity Hall Hill*, *St. Thomas*, *Harris* & *Britton*! *Fl. Jam.* 10,042, 10,714.—*Florida*, *Bahamas*, *West Indies*, *tropics generally*.

A straggling shrub climbing high in trees, generally armed with curved spines. Leaves 3-11 cm. l., 2-6 cm. br., variable in shape, broadly or narrowly elliptical, subrhomboid or broadly lanceolate, apex acuminate, acute or obtuse, sometimes narrowing at the base into the stalk, on both sides glabrous or occasionally pubescent, or glabrous on upper surface and tomentellous beneath, somewhat leathery, nerves not strongly marked, arching, veins somewhat indistinct. Inflorescence puberulous. Flowers greenish-yellow, fragrant. Male perianth broadly campanulate, 3.5-4 mm. l.; female tubular, 2-2.5 mm. l. Stamens generally 6, longer than the style of the sterile ovary, 4.5-6 mm. l. Anthocarp generally about 1.5 cm. l., 3-4 mm. br., 3-5 times as long as broad.

§ 2. Anthocarp ellipsoidal, fleshy on the outside, not glandular, ribbed (when dry).

2. *P. obtusata* *Jacq. Hort. Schoenbr. iii. 35, t. 314* (1798); leaves elliptical, obovate-elliptical or broadly to roundish elliptical, apex broadly rounded or sometimes emarginate, base cuneate or rounded, leathery, nerves and veins densely reticulate, prominulous especially beneath; panicle erect, corymbiform or pyramidal.—*Choisy tom. cit.* 443; *Griseb. op. cit.* 71 (in part); *Urb. loc. cit.* (non *Sw.*). *P. calophylla* *Heimerl tom. cit.* 625 (1896). *Torrubia obtusata* *Britton in Torr. Bot. Cl. Bull. xxi.* 612 (1904). Type in *Herb. Mus. Brit.*

*Bertero*; *Prior*; *March*! *Kingston*; *Long Mt.*; *Campbell*! *Long Mt.*, 800 ft., *Harris*! *Fl. Jam.* 6426, 6500, 8927.—*Bahamas*, *Cuba*, *Hispaniola*.

Shrub or tree to 25 ft. high. Leaves 3.5-8.5 cm. l., 2.5-6 cm. br.; petioles 7-1.4 cm. l., with reddish tomentum, later glabrate. Panicle with reddish tomentum, male many- and dense-flowered, female laxer; buds with reddish tomentum. Flowers glabrescent, sessile or subsessile. Male flowers with funnel-shaped perianth, 4-5 mm. l., 6-8 stamens, 6 mm. l., and short abortive ovary and style. Female flowers with tubular perianth 2.5-3.5 mm. l. Anthocarp 4 mm. l.

3. *P. fragrans* Dumont *Cours. Bot. Cult. ed. 2, vii. 114* (1814); leaves very variable even on the same branch, elliptical or obovate-elliptical to obovate-lanceolate, apex subacuminate, obtuse or rounded, base attenuated or obtuse, membranous, almost the same colour on both sides, nerves distinct, arching towards the margin, veins very few and indistinct, with short glabrous slender stalks; panicle solitary, erect, terminal, corymbiform, many- and subdense-flowered, when young brown-puberulous, at length glabrate; male flowers with funnel-shaped perianth; stamens 6-8; female perianth tubular with expanding limb irregularly dentate; style exserted; stigma multifid; anthocarp oblong-elliptical, subtomentous on outside, ribbed (when dry).—*Urb. tom. cit. 225*. *P. obtusata* Griseb. *loc. cit.* (in part) (non Jacq.); *Heimerl op. cit. 624* (in part). *P. inermis* Griseb. *loc. cit.* (1859) (in part) (non Jacq.). *P. Harrisiana* Heimerl in *Urb. Symb. Ant. vii. 214* (1912). *Torrubia inermis* Britton *tom. cit. 614* (1904).

Wright! Lindsay! Hartweg! near Port Maria, Purdie! Wilson! Moneague, Prior! March! Montego Bay, McCatty! Cherry Garden, 600 ft.; Hope; Rock Fort (sea coast); Campbell! Claverty Cottage, 2000 ft.; Sheldon Road, 2500 ft.; Stony Hill, 900 ft.; Long Mt., 100 ft.; Chelsea Hill, S. Cruz Mts., 2200 ft.; Potsdam, 2600 ft.; Spur Tree Hill, 1800 ft.; near Malvern, 400 ft.; near Ferry; Tyre. Fl. Jam. 5764, 6030, 6063, 6369, 6520, 8385, 9577, 9688, 9779, 9820, 9857, 9917, 10,814.—West Indies.

Shrub or tree 18-25 ft., sometimes to 50 ft. high. Branchlets ashen-grey. Leaves 4.5-10 cm. l., 2.5-5 cm. br.; petioles 5-1.5 cm. l. Flowers tawny-yellow, sessile or subsessile. Perianth, male 4 mm. l., female 3 mm. l. Stamens to 8 mm. l., much exserted. Fruit 6.5-10 mm. l., 3-4 mm. thick, red.

4. *P. discolor* Spreng. *Syst. ii. 168* (1825); leaves variable, broadly or narrowly elliptical, oblong, obovate or oblanceolate, base cuneate or rarely rounded, stalked, apex obtuse or rounded, thin, often much lighter-coloured beneath, nerves more or less indistinct, arching towards the margin; petioles slender; inflorescence lax, generally two or more panicles or racemes together, from shortened shoots in the axils of leaves, few-flowered, ultimate branches somewhat tomentose or glabrous; flowers puberulous or glabrescent; fruit fleshy on outside, oblong or somewhat obovoid, red, pulp rather thin, ribbed (when dry).—*Choisy op. cit. 443*; *Griseb. op. cit. 710*; *Heimerl in Engl. Bot. Jahrb. xxi. 626*. *Torrubia discolor* Britton *tom. cit. 613* (1904). *T. longifolia* Britton *tom. cit. 614* (1904).

Wright! Bertero; March! Long Mt., near sea-coast, Grabham! Long Mt.; Pedro Bluff, Black River, Spur Tree Hill, 1800 ft., Harris! Fl. Jam. 7871, 7872, 8923, 9577, 9732, 9735, 9855, 9857.—Bahamas, Cuba, Hispaniola.

Shrub (often trailing) or tree to 18 ft. high. Leaves 2-6.5 cm. l., 1-4 cm. br.; petioles 2-1.2 cm. l. Flowers sessile or subsessile. Perianth, male 4-4.5 mm. l. (fide Heimerl), female about 3 mm. l. Fruit 7 mm. l.

## 4. NEEA Ruiz &amp; Pav.

Trees or shrubs. Leaves opposite. Flowers small, with 3 minute bracteoles, dioecious, in solitary terminal stalked paniculate corymbiform cymes. Male flowers: perianth tubular-campanulate, slightly urceolate, 5-toothed; stamens 8, included, inserted with the aborted ovary at the base of the flower; filaments unequal. Female flowers: perianth tubular-urceolate, 5-toothed; stamens with sterile anthers inserted at the base of the ovary; style included; stigma penicillate at the mouth of the perianth.

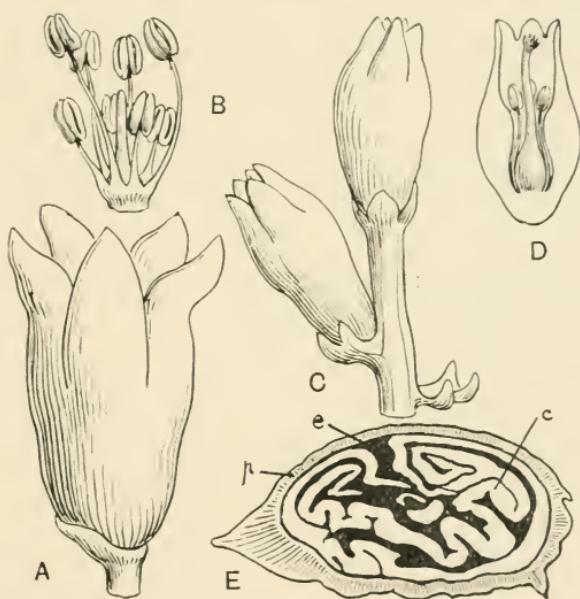


Fig. 52.—*Neea nigricans*. Fawc. & Rendle.

A, Male flower  $\times 5$ .

B, Do. with perianth removed  $\times 5$ .

C, Female flowers  $\times 5$ .

D, Female flower cut lengthwise  $\times 5$ .

E, Fruit in section  $\times 5$ ; *p*, pericarp;

*e*, endosperm; *c*, cotyledons.

Anthocarp somewhat fleshy on the outside, crowned by the persistent perianth (otherwise agreeing with *Pisonia*).

Species about 43, natives of tropical America, chiefly South America, a few in Central America and the West Indies.

Tomentum of buds and twigs white..... 1. *N. nigricans*.  
Tomentum of buds and twigs reddish ..... 2. *N. rotundifolia*.

1. ***N. nigricans* comb. nov.**; twigs, petioles, inflorescence and buds white-tomentellous; leaves narrowly elliptical to oblong-

elliptical, more or less acuminate, membranous, nerves and veins prominulous on both sides; *N. jamaicensis* *Griseb. Fl. Br. W. Ind.* 71 (1859); *Heimerl in Engl. Bot. Jahrb. xxi.* 634. *Pisonia nigricans* *Sw. Prodr.* 60 (1788) & *Fl. Ind. Occ.* 643; *Choisy in DC. Prodr. xiii. pt. 2,* 442 (so far as regards reference to *Swartz, Jamaica*). (Fig. 52.)

*Wright!* *Wilson!* *Browns Town, Prior!* *Yallahs Valley, 1500 ft.; Mt. Lebanon, 2500 ft.; Petersfield, 2500 ft.; Holly Mount, 3000 ft.; near Flamstead, 3000 ft.; Catadupa, 1500 ft.; Tyre; Peckham, Clarendon, 2500 ft.; Harris!* north coast; *Cuna Cuna Pass; Harris & Britton!* *Fl. Jam.* 5743, 6100, 6627, 6652, 9004, 9032, 9180, 10,536, 10,567, 10,813, 10,958, 11,036, 11,053, 11,076, 11,183, 11,207.

Shrub or tree, 12 to 50 ft. high. Leaves 4-15 cm. l., 2.5-6.5 cm. br.; petioles 1-2 cm. l. Inflorescence lax; flowers sessile or subsessile, yellowish. Perianth, male nearly 6 mm. l., female about 4 mm. l. Fruit 1.2 cm. l., 8-9 cm. br., ellipsoidal, somewhat compressed, scarlet, ribbed (when dry). Tree, when of good size useful as timber.

2. *N. rotundifolia* *Heimerl in Urb. Symb. Ant. vii.* 218 (1912); twigs, petioles, inflorescence and buds red-tomentellous; leaves broadly elliptical to almost roundish, thinly leathery, nerves slightly prominulous on both sides, veins flat and inconspicuous.

Peckham, Clarendon, 2500 ft., *Harris!* *Fl. Jam.* 10,985.  
Tree 25 ft. high. Leaves 6-11.5 cm. l., 4.3-8.8 cm. br.; petiole 1.2-2.5 cm. l. Flowers sessile or subsessile.

To this family (*Nyctaginaceæ*) belong *Bougainvillea spectabilis* Willd. and *B. glabra* Choisy, climbing shrubs with tubular flowers inserted one on each of 3 large coloured bracts, natives of Brazil and commonly grown in tropical and subtropical gardens.

#### FAMILY XVIII. PHYTOLACCACEÆ.

Shrubs or herbs sometimes woody at the base, generally glabrous. Leaves alternate, entire. Stipules wanting or small. Flowers in terminal or axillary racemes, generally green or white, with bracts and 2 bracteoles. Flowers hermaphrodite. Perianth with 4 or 5 segments, imbricate in bud, persistent. Petals wanting except in *Stegnosperma*. Stamens either of the same number as the perianth-segments and alternate with them, or more and inserted irregularly or opposite and alternately; filaments generally persistent and anthers deciduous. Ovary free, of one or several one-ovuled carpels (except *Microtea*); style short or wanting. Ovules shortly stalked, basilar. Fruit of one carpel, a berry, or of several carpels. Seeds erect (enclosed by an aril in *Stegnosperma*). Embryo annular, or semi-annular, surrounding the endosperm, except in *Petiveria* and *Stegno-*

*sperma*; cotyledons foliaceous or semiterete, sometimes one much larger than the other, convolute or folded on themselves.

Species about 90, mostly natives of tropical and subtropical regions.

Perianth of a single series.

Perianth-segments 4.

Fruit globose.

Stamens 4. Stigma capitate ..... 1. *Rivina*.

Stamens 8-16. Stigma penicillate ..... 2. *Trichostigma*.

Fruit elongate, with deflexed hooks at apex ..... 3. *Petiveria*.

Perianth-segments 5.

Ovary one-celled, with 2 stigmas ..... 6. *Microtea*.

Ovary several-celled, with as many stigmas as

cells ..... 4. *Phytolacca*.

Perianth of calyx and corolla ..... 5. *Stegnosperma*.

### 1. RIVINA L.

Erect herbs, shrubby below. Leaves alternate, or subopposite on shortened branches. Flowers hermaphrodite, in racemes.

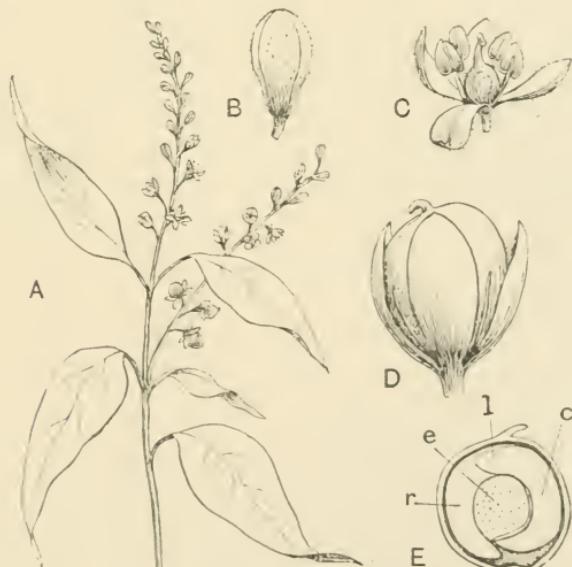


Fig. 53.—*Rivina humilis* L.

A, Upper portion of branch  $\times \frac{1}{2}$ .

B, Flower-bud  $\times 7$ .

C, Flower  $\times 7$ .

D, Fruit  $\times 5$ .

E, Section of seed  $\times 5$ ; e, endosperm; c, cotyledons; l, lobed base of cotyledon; r, radicle.

Bracts and bracteoles minute, deciduous. Perianth corolline, 4-cleft; segments increased in fruit. Stamens 4. Ovary of one

carpel; style short, stigma capitate. Fruit a globose berry, with fleshy pericarp. Embryo annular, surrounding mealy endosperm; cotyledons convolute.

Species 3, natives of tropical and subtropical America.

*R. humilis* L. *Sp. Pl.* 121 (1753); *Moq.* in *DC. Prodr.* *xiii.* pt. 2, 13; *Baill. Hist.* *iv.* 33, 34; *Urb. Symb. Ant.* *iv.* 228; *H. Walt.* in *Engl. Pflanzenreich* *iv.* pt. 83, 102. *R. laevis* L. *Mant.* 41 (1767); *Moq.* *tom. cit.* 11; *Griseb. Fl. Br. W. Ind.* 59. *R. dichotoma* &c. *Browne Hist. Jam.* 148. Type in *Herb. Linn.* (Fig. 53.)

#### Bloodberry.

*Browne*; *Broughton*! *Distin*! *Cuming*! near Greenwich, *McNab*! *Gosse*! *St. Ann*, *Prior*! *March*! *Hopewell*, *St. Mary*, *Pott*! *Ginger Piece*, *Blue Mts*, *J.P. 1462*, *Hart*! *Hope*, *Harris*! *Arcadia*, *Mrs. Sewell*! *Up Park Camp*, *Campbell*! *Annotto Bay*, *Thompson*! *Fl. Jam.* 5779, 6083, 6663, 6854, 8074.—*Florida*, *Bahamas*, *Cayman*, *West Indies*, *tropical and subtropical continental America*.

Plant 2–3 ft. high, pubescent or glabrous. Leaves ovate, acuminate, 2–9(–12) cm. l. Perianth white or pinkish, 2–2·3 mm. l., in fruit to 3 mm. l. Fruit scarlet, at length dry, about 3 mm. l. when dry. Berries sometimes used for colouring.

## 2. TRICHOSTIGMA A. Rich.

Undershrubs, erect or climbing. Leaves alternate or subopposite in shortened twigs; stipules minute, deciduous. Flowers hermaphrodite, in terminal and axillary racemes. Bracts deciduous; bracteoles persistent. Perianth herbaceous, 4-cleft; segments increasing a little and reflexed in fruit. Stamens 8–16. Ovary of one carpel; stigma sessile, penicillate. Fruit a globose berry, with fleshy pericarp. Embryo annular, surrounding floury endosperm.

Species 3, natives of tropical America.

*T. octandrum* *H. Walt.* in *Engl. Pflanzenreich* *iv.* pt. 83, 109. *T. rivinoides* A. Rich. in *Sagra Cub.* *x.* 306 (1845). *Rivina humilis* var. *scandens* L. *Sp. Pl.* 122 (1753). *R. octandra* L. *Cent. Plant.* *ii.* 9 (1756) & *Sp. Pl. ed.* 2, 177; *Wright Mem.* 265; *Moq.* in *DC. Prodr.* *xiii.* pt. 2, 11; *Griseb. Fl. Br. W. Ind.* 59. *R. sarmentosa* &c. *Browne Hist. Jam.* 149, *t. 23, f. 2*. *Villamilla octandra* *Hook. f.* in *Benth. & Hook. f. Gen. Plant.* *iii.* 81 (1880); *Urb. Symb. Ant.* *iv.* 228. Type in *Herb. Linn.* (Fig. 54.)

#### Hoop Withe, Cooper Withe.

*Wright*! *Bancroft*! *St. Mary*, *McNab*! *Purdie*! *Yallahs Valley*, *Prior*! *March*! *J.P. 946*, *Hart*! *Yallahs Valley*, 2800 ft., *Harris*! *Windward Road*, *Harris & Britton*! *Fl. Jam.* 6591, 10,796.—*Cayman*, *West Indies*, *tropical continental America*.

Stems climbing amongst shrubs and low trees to a height of 20 ft.

Leaves elliptical to lanceolate, acuminate, cuneate at base, 5-11 cm. l. Perianth whitish, about 4 mm. l., increasing to 5 mm. in fruit. Fruit purplish-black, 5 mm. l.

The common names indicate its uses. The berries are said to be the chief food of the "nightingale" (P. Browne).

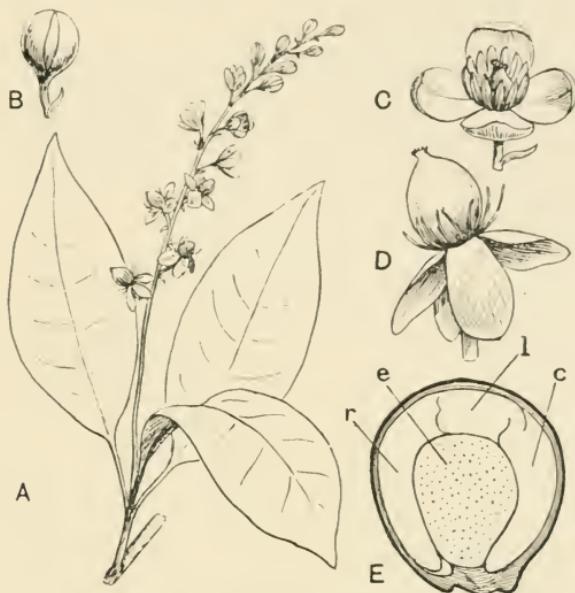


Fig. 54.—*Trichostigma octandrum* H. Walt.

A, Upper portion of branch  $\times \frac{1}{2}$ .

B, Flower-bud  $\times 2$ .

C, Do. opened  $\times 2$ .

D, Fruit  $\times 3$ .

E, Section of seed  $\times 4$ ; e, endosperm; c, cotyledons; l, lobed base of cotyledon; r, radicle.

### 3. PETIVERIA L.

Herb, deeply rooting, shrubby at base, with odour of garlic. Leaves alternate, entire; stipules minute. Flowers hermaphrodite, in axillary and terminal spikes, which are solitary or two together, erect or nodding. Perianth 4-cleft, segments slightly increased in fruit. Stamens 4-8, perigynous. Ovary ellipsoidal, tomentose, of one carpel, with 4 deflexed hook-like processes at the top; stigma sessile, penicillate, on the ventral side. Fruit elongate-cuneate, covered in the lower half by the persistent perianth, with 4 small lobes at the top from each of which is a deflexed hook. Seed erect, linear, adherent to pericarp; endosperm scanty. Embryo erect; cotyledons foliaceous, unequal in size, the smaller exterior, folded on themselves; radicle stout.

Species 2, natives of West Indies and warmer parts of America.

*P. alliacea* L. Sp. Pl. 342 (1753); Trew Pl. Select. 33, t. 67; Sw. Obs. Bot. 138, t. x. f. iii.; Moq. in DC. Prodr. xiii. pt. 2, 9;

*Griseb. Fl. Br. W. Ind.* 59; *Urb. Symb. Ant.* iv. 229; *H. Walt.* in *Engl. Pflanzenreich* iv. pt. 83, 118. Verbenæ aut scorodoniae affinis &c. *Sloane Cat.* 64 & *Hist.* i. 172. *Petiveria* foliis &c. *Browne Hist. Jam.* 274. Type in *Herb. Linn.* (Fig. 55.)

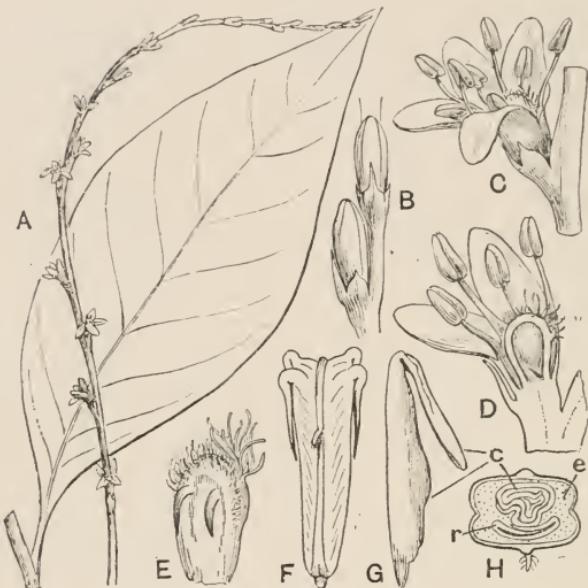


Fig. 55.—*Petiveria alliacea* L.

A, Leaf and spike  $\times \frac{2}{3}$ .  
B, Flower-buds  $\times 3$ .

C, Flower  $\times 5$ .  
D, Do, cut lengthwise  $\times 5$ .  
E, Ovary  $\times 10$ .

F, Fruit  $\times 3$ .

G, Embryo  $\times 3$ .

H, Section of seed; e, endosperm; c, cotyledons; r, radicle.

#### Guinea-Hen Weed.

*Sloane Herb.* iii. 52\*! *Houston!* *Broughton!* *Gosse!* *Prior!* *Hope!* *Harris!* *Providence*, near *Castleton*, 700 ft., *Thompson!* *Fl. Jam.* 6872, 8065.—*Florida*, *West Indies*, continental tropical America.

Plant 1-3 ft. high. Leaves 6-14 cm. l., 2.5-5.2 cm. br., elliptical or narrowly elliptical. Perianth white, about 4 cm. l. Fruit nearly 1 cm. l.

The plant has a strong garlic smell, and imparts a disagreeable flavour to the milk and flesh of cattle feeding on it.

#### 4. PHYTOLACCA L.

Herbaceous plants or shrubby below, erect (in West Indian species). Leaves alternate, entire. Flowers hermaphrodite (in W. Ind. spp.), in racemes at first subterminal, later opposite the leaves. Perianth 5-cleft. Stamens 8-20 (in W. Ind. spp.), inserted at the base of the perianth. Ovary of 8-12 carpels; styles as many as carpels; ovules solitary in the cells. Fruit fleshy on outside. Seeds somewhat kidney-shaped, compressed;

embryo annular, surrounding the floury endosperm, cotyledons semiterete, radicle long. Mountain Calalu, Jocato, Poke Weed.

Species 26, natives of tropics and subtropics, chiefly American.

Pedicels longer than the flowers. Perianth 2 mm. l. .... 1. *P. rivinoides*.  
Pedicels as long as the flowers. Perianth about 4 mm. l. 2. *P. icosandra*.

1. *P. rivinoides* Kunth & Bouché in *Ind. Sem. Hort. Berol.* (1848) 15; racemes much longer than the leaves; pedicels

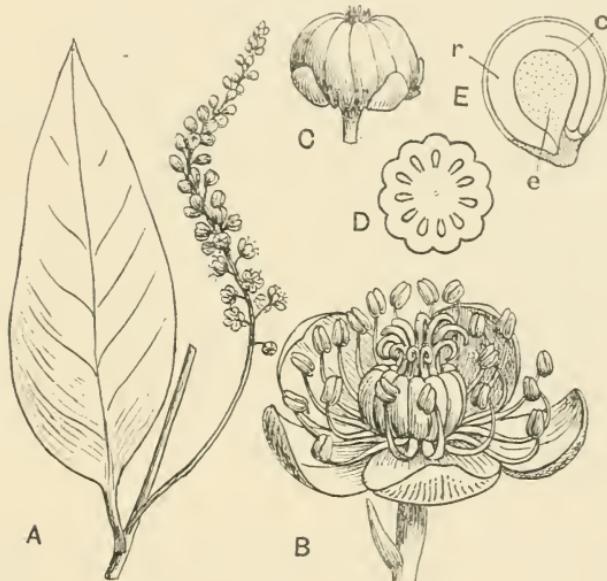


Fig. 56.—*Phytolacca icosandra* L.

A, Raceme and leaf  $\times \frac{1}{2}$ .

B, Flower  $\times 5$ .

C, Fruit  $\times 2$ .

D, Fruit cut across  $\times 2$ .

E, Seed in section  $\times 7$ .

longer than the flowers, 5–10 mm. l.; perianth-segments pink, broadly elliptical, about 2 mm. l. and 1.5 mm. br., reflexed and generally deciduous in fruit; stamens 20–10; carpels 16–10.—*H. Walt.* in *Engl. Pflanzenreich* iv. pt. 83, 55. *P. icosandra* *Wright* *Mem.* 268 (1828) (non *L.*); *Moq.* in *DC. Prodr.* xiii. pt. 2, 33: *Hook. Bot. Mag.* t. 4967; *Griseb. Fl. Br. W. Ind.* 58; *Urb. Symb. Ant.* iv. 229.

*Wright!* *Distin!* *Morse's Gap, McNab!* *Bethabara, Wüllschlaegel!* *Castleton, Hart!* *Vinegar Hill, 3500 ft., Harris!* *Fl. Jam.* 6417.—West Indies, Central and tropical South America.

*Stem* somewhat shrubby below, 4 ft. high. *Leaves* elliptical, ovate or ovate-lanceolate, acuminate, 10–20 cm. l., 4–8 cm. br., green, covered with

minute white dots and with a narrow pellucid margin; petioles 2-6 cm. l. *Racemes*, including the long peduncle, 2-6 dm. l., lax-flowered. *Bracts* 2-3.5 mm. l.; bracteoles .8-1 mm. l., adnate about the middle of the pedicel. *Fruit* black, 5-7 mm. in diam., depressed. *Seed* subreniform, 2-2.2 mm. l.

H. Walter, quoting Eggers, notes this species as scandent and attaining a height of 2-5 m.

2. *P. icosandra* L. *Syst. ed.* 10, 1040 (1759); racemes much longer than the leaves; pedicels about as long as the flowers, 4-5 mm. l. (-7), scarcely increased in fruit; bracts as long as, or a little longer than the pedicels; bracteoles half as long as bracts; perianth-segments broadly elliptical, persistent and not reflexed in fruit, 3.5-4.5 mm. l., 2.5-3.5 mm. br.; stamens about 20; carpels 10-12.—*L. Sp. Pl. ed.* 2, 631; *Bot. Mag.* t. 2633; *H. Walt. in Engl. Pflanzenreich iv. pt.* 83, 60. (Fig. 56.)

*Broughton!* *Wullschlaegel!* *Cinchona*, 5000 ft., J.P. 1266, *Morris!* Farm Hill, 4000 ft., *Gosset!* *Christiana*, 3200 ft., *Miss Wood!*—Cuba, Hispaniola, Central and tropical South America.

Stem shrubby, branching, erect, angled, glabrous. Leaves narrowly elliptical or ovate-elliptical, apex acute or cuspidate, base cuneate, nerves prominulous beneath, 10-17 cm. l., 4-8 cm. br.; petiole 2-4 cm. l. *Inflorescence* laxly racemose, uppermost terminal, the rest opposite or nearly opposite a leaf; raceme in fruit 27 cm. l.; peduncles 5-7.5 cm. l. *Bracts* linear-lanceolate; bracteoles at middle of pedicel or nearer the flower. *Stamens* in 2 series, inserted on a disk, shorter than the perianth, filaments subulate, about 2.2 mm. l.; anthers about 1 mm. l., oblong-elliptical. *Ovary* subglobose; carpels connate, about 1.2 mm. l.; styles as many as carpels, recurved, 1.5 mm. l. *Fruit* 5-7 mm. in diam. *Seed* obovoid-roundish, 2.3-2.7 mm. l., 2-2.3 mm. br.

The Jamaican specimens tend to have rather larger flowers, and longer pedicels, bracts and bracteoles than usual.

### 5. STEGNOSPERMA Benth.

Erect shrub. Leaves alternate. Flowers hermaphrodite in racemes at ends of branches. Calyx with 5 segments which enlarge in the fruit. Petals 5. Stamens 10, joined at the base in a perigynous ring, persistent in the fruit. Ovary 1-celled, the cell surrounding a central column; stigmas 3-5; ovules as many as stigmas, basal, erect. Capsule globose, hard and brittle, 3-5-angled, 1-celled, 3-5-valved to the base, with 1 to 5 seeds. Seeds enclosed in a white, fleshy aril, obovoid, black. Outer seed-coat crustaceous, inner thick membranous. Embryo narrow, slightly curved close to the inner seed-coat; cotyledons flattened, face to face, equal; radicle about half length of embryo, cylindrical.

Species 1, native of Cuba, Jamaica, Hispaniola, Central America and California.

*S. halimifolia* Benth. *Bot. Sulph.* 17, t. 12 (1844); *Moq. in DC. Prodr. xiii. pt. 2*, 36; *Britton in Torr. Bot. Cl. Bull.* xxv.

567; Walt. in *Engl. Pflanzenreich* iv. pt. 83, 123. *S. cubense* A. Rich. in *Sagra Cub.* v. 309 (1845), t. 44<sup>3</sup> (1855). (Fig. 57.)

Healthshire Hills, 330 ft., *Britton & Harris*! Fl. Jam. 10,522.—  
Distribution as under genus.

Described by Dr. Britton as "A woody vine 8 m. long, climbing to the tops of low trees; its reddish fleshy fruits are 3-grooved, borne in short

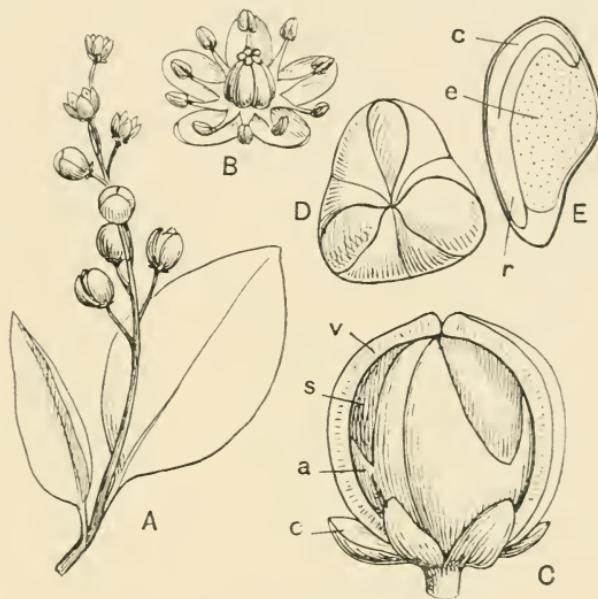


Fig. 57.—*Stegnosperma halimifolia* Benth.

A, Upper portion of branch  $\times \frac{3}{4}$ . C, Fruit with one valve removed  $\times 3$ ; B, Flower from which the petals have fallen  $\times 2$ . D, Seeds enclosed by the aril  $\times 3$ . E, Seed in section  $\times 5$ ; c, endosperm; e, cotyledons; r, radicle.

terminal racemes." Leaves elliptical, obtuse, 2-5 cm. l., 1-3.5 cm. br., thin, nerves and veins somewhat indistinct on upper surface, but distinctly reticulate beneath. Racemes 4 cm. l. (4 times as long in continental specimens). Pedicels 5 cm. l. Flowers of Jamaican plant not seen. Calyx (in fruit) 4 mm. l. Capsule about 7 cm. l. with calyx and filaments persistent.

#### 6. MICROTEA Sw.

Annual herbs. Leaves alternate, entire. Flowers minute, in terminal and axillary racemes, hermaphrodite. Perianth with 5 segments. Stamens 5(-8), united at base. Ovary one-celled, of two carpels; stigmas 2; ovule solitary. Fruit globose, tuberculate. Embryo semi-annular, surrounding endosperm;

cotyledons flattish-concave, one twice as large as the other; radicle thick, short.

Species 10, natives of West Indies and tropical South America.

*M. debilis* Sw. *Prodr.* 53 (1788) & *Fl. Ind. Occ.* 543, t. 12; *Moq. in DC. Prodr.* xiii. pt. 2, 17; *Griseb. Fl. Br. W. Ind.* 59. (Fig. 58.)

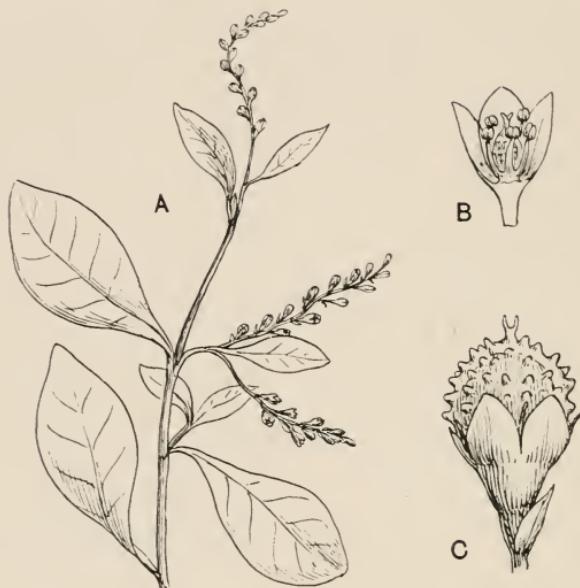


Fig. 58.—*Microtea debilis* Sw.

A, Upper portion of branch  $\times \frac{2}{3}$ . B, Flower with part of perianth removed  $\times 10$ . C, Fruit  $\times 10$ .

Sea-coast, Negril, *Harris!* Fl. Jam. 10,214.—St. Cruz, St. Eustatius, St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Tobago, Trinidad, Ruatan, tropical America.

Plant  $\frac{1}{2}$ - $1\frac{1}{2}$  ft. Leaves obovate or oblanceolate, 3-7 cm. l., 1.5-3.5 cm. br. Perianth white, 1 mm. l. Fruit 1.5 mm. l., greenish-black covered with a white network uniting the tubercles.

#### FAMILY XIX. FICOIDEACEÆ.

Herbs. Leaves opposite, alternate or spuriously whorled, entire. Flowers hermaphrodite. Perianth with 5 segments, free from ovary (in W. Indian genera), greenish, imbricate, persistent in fruit. Stamens perigynous or hypogynous, definite or indefinite. Ovary 3-5-celled (1-celled in *Trianthema*). Styles as many as the cells of the ovary. Fruit a capsule, loculicidally

or transversely dehiscent. Embryo curved, surrounding the mealy endosperm; cotyledons narrow.

Species 600, natives of tropical and subtropical regions.

Capsule loculicidal.

Plant covered with stellate hairs ..... 1. *Glinus*.

Plant glabrous ..... 2. *Mollugo*.

Capsule circumsciss.

Stamens numerous. Capsule 3-5-celled ..... 3. *Sesuvium*.

Stamens 6-10. Capsule 1-celled ..... 4. *Trianthema*.

### 1. GLINUS L.

Annual herbs, stems prostrate, much branched. Leaves alternate or spuriously whorled, unequal, entire. Flowers in few-flowered cymes, clustered. Perianth with 5 segments, green,

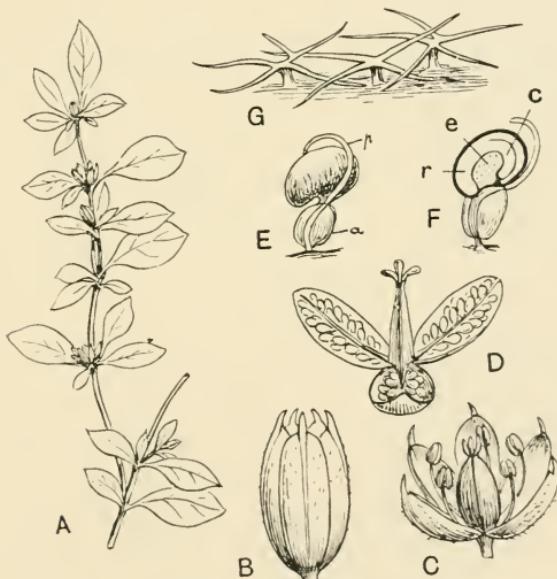


Fig. 59.—*Glinus radiatus* Rohrb.

A, Portion of plant in flower  $\times \frac{1}{2}$ .  
B, Flower unopened  $\times 5$ .  
C, Do., opened  $\times 5$ .  
D, Capsule opened  $\times 5$ .

E, Seed with aril (a) and appendage (p)  $\times 20$ .  
F, Do. in section  $\times 20$ ; e, endosperm; c, cotyledons; r, radicle.  
G, Stellate hairs of plant  $\times 50$ .

with scarious margin. Stamens 3-5, inserted at the bottom of the perianth. Ovary 3-(5-)celled; ovules numerous, inserted on long stalks at the interior angle, style short with 3 (to 5) stigmas. Capsule 3-(5-)celled, loculicidally 3-(5-)valved. Seeds numerous,

stalked; aril present at the hilum with a free stalk-like appendage passing round the seed.

Species few, natives of tropical and subtropical regions.

*G. radiatus* Rohrb. in *Fl. Bras.* xiv. pt. 2, 238, t. 55, f. 1.  
*G. Cambessidesii* Fenzl in *Ann. Wien. Mus.* i. 358 (1836). *Mollugo radiata* Ruiz & Pav. *Fl. Peru. & Chil.* i. 48 (1798). (Fig. 59.)

Four Paths, Clarendon, 240 ft., *Harris & Britton!* *Fl. Jam.*, 10,634.—Brazil, Chile.

Plant covered with stellate hairs. Stems 1-2 dm. l. Leaves elliptical or spatulate, 4-10 mm. l. (-20), 3-7 mm. br. (-10). Flowers in clusters of 3 to 6. Perianth-segments somewhat hooded, mucronate at apex, 4 mm. l. Stamens 3-5. Seeds very numerous, light-brown, smooth, 4 mm. l.; aril about half as long.

## 2. MOLLUGO L.

Erect or diffuse annual glabrous herbs. Leaves radical or caudine and sparsely whorled. Stipules none or very rare, membranous, deciduous early. Inflorescence contracted into sessile umbellules at the nodes or paniculate cymes with scape-

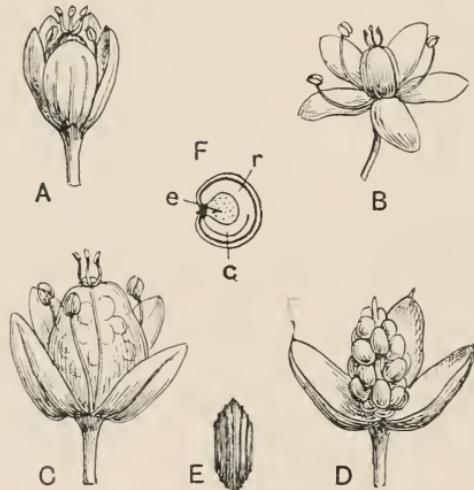


Fig. 60.—*Mollugo verticillata* L.

A, Flower-bud opened  $\times 5$ .

B, Do. opened wider  $\times 5$ .

C, Capsule with persistent perianth and stamens  $\times 5$ .

D, Capsule open  $\times 5$ .

E, Seed seen sideways  $\times 12$ .

F, Do. in section; e, endosperm; c, cotyledons; r, radicle.

like peduncles. Flowers stalked. Perianth of 5 persistent segments, green with scarious margins. Stamens 3 to 5, hypogynous, persistent. Ovary 3-celled; styles 3-5; ovules numerous, attached to the inner angle. Capsules included by the perianth, 3-celled, loculicidally 3-valved. Seeds numerous, without an aril.

Species 15, natives of the tropics of the Old World; a few also in tropical and north temperate America.

Leaves whorled..... 1. *M. verticillata*.  
Leaves all radical..... 2. *M. nudicaulis*.

1. *M. verticillata* *L. Sp. Pl.* 89 (1753) (excl.  $\beta$ ); stems diffuse-erect or lying along the ground; leaves whorled, spathulate-lanceolate, lanceolate-linear or linear; inflorescence contracted into sessile umbellules at the nodes; seeds kidney-shaped, with ridges along the back.—*Macf. Jam.* i. 51; *Griseb. Fl. Brit. W. Ind.* 56; *Rohrb. in Fl. Bras.* xiv. pt. 2, 240, t. 55, f. II.; *Urb. Symb. Aut.* iv. 230. Type in *Herb. Linn.* (Fig. 60.)

*Houstoun* in *Herb. Sloane* iv. 7a! *Broughton!* *Masson!* *Macfadyen!* near Kingston, *McNab!*—Cuba, Hispaniola, Porto Rico, Buck Island near St. Thomas, St. Bartholomew, St. Vincent, continental America.

Stems to 40 cm. l. Leaves 4–5 (–10) at a node, 7–2·5 cm. l. Perianth about 2·5 mm. l., green or purplish. Stamens generally 3, sometimes 4 or 5. Seeds 6 mm. l.

2. *M. nudicaulis* *Lam. Encyc.* iv. 234 (1797); leaves only radical, in an erect-spreading tuft on the ground from which the stalked paniculate cymes arise; seeds globulose-kidney-shaped, granulate, black.—*Griseb. loc. cit.*; *Rohrb. tom. cit.* 244; *Urb. loc. cit.* *M. bellidifolia* *Ser. in DC. Prodr.* i. 391; *Macf. Jam.* i. 52. *Alsini affinis*, *foliis bellidis minoris, caule nudo* *Sloane Cat.* 87 & *Hist.* i. 203, t. 129, f. 2. *Alsine auriculæ ursi foliis* *Plum. Pl. Amer. (Burm.)* t. 21, f. 1. *Pharnaceum spathulatum* *Sv. Fl. Ind. Occ.* 568 (1797).

“Sandy places of the Town Savanna towards Two Mile Wood,” *Sloane Herb.* iv. 9! *Masson!*—Cuba, Porto Rico, St. Thomas, Buck Island, St. Cruz, St. Lucia, Guiana, tropical Africa, India, New Caledonia.

Plant to 9 in. high. Leaves broadly spathulate or obovate narrowed into a long petiole, to 4 cm. l. Perianth about 2 mm. l., greenish outside, white inside. Stamens 5.

### 3. SESUVIUM L.

Herbs, perennial, sometimes somewhat shrubby, branching, succulent. Leaves opposite, fleshy, linear or oblong. Flowers axillary. Perianth persistent, united below into a cup, 5-lobed, lobes mucronate near apex, coloured inside. Stamens numerous (in the W. Indian species); filaments inserted at the top of the perianth-cup. Ovary free, 3–5-celled; styles 3–5, papillose on the inside; ovules numerous in the cells. Capsule oblong, 3–5-celled, circumsciss, cells with numerous seeds. Seeds stalked: embryo annular.

Species 7, on sea-shores of the tropics and subtropics.

**S. Portulacastrum** L. *Syst. ed.* 10, 1058 (1759); *Jacq. Sel. Stirp. Amer.* 155, *t.* 95; *Sw. Obs.* 204; *Macf. Jam.* ii. 171; *Griseb. Fl. Br. W. Ind.* 57; *Rohrb. in Fl. Bras.* xiv. *pt.* 2, 310, *t.* 70; *Urb. Symb. Ant.* iv. 230. *Aizoon repens* foliis &c. *Browne Hist. Jam.* 241. *Portulaca Portulacastrum* L. *Sp. Pl.* 446 (1753). *Portulaca aizoides* maritima &c. *Sloane Cat.* 88 & *Hist. i.* 204. (Fig. 61.)

“Sampier” (Sloane).

Sea-shore. Passage Fort, Old Harbour, and Cays off Port Royal, *Sloane Herb.* iv. 9\*! *Broughton!* *Macfadyen*; *March!* sea-coast, Don-

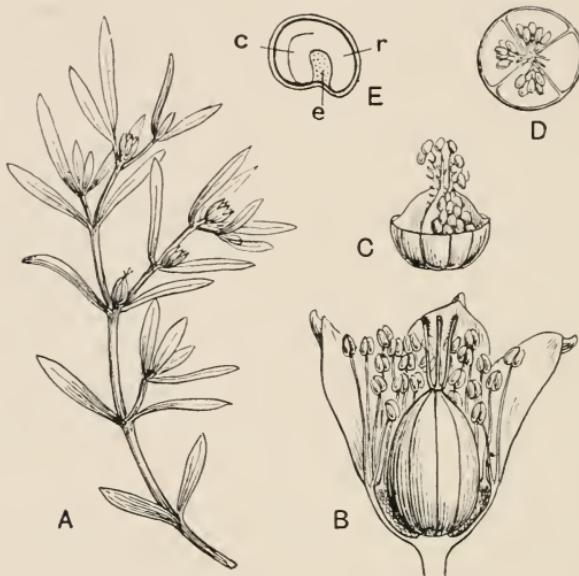


Fig. 61.—*Sesuvium Portulacastrum* L.

A, Portion of plant in flower  $\times \frac{2}{3}$ .  
 B, Flower with portion of perianth and some stamens removed  $\times 3$ .  
 C, Capsule with upper part fallen  $\times 3$ .  
 D, Lower part of C cut across  $\times 3$ .  
 E, Seed in section  $\times 10$ ; *e*, endosperm; *c*, cotyledons; *r*, radicle.

caster Pen, *Campbell!* Spanish Town road, *Harris!* *Fl. Jam.* 6428, 6579, 8183, 9105.—Bermuda, Bahamas, Cayman, Cuba, Hispaniola, Porto Rico, St. Thomas, St. Jan, St. Cruz, St. Bartholomew, St. Kitts, Sandy Is. near Antigua, Guadeloupe, Martinique, St. Vincent, Bequia, Barbados, Curaçao, tropical and subtropical regions.

Stems trailing with ascending to erect branches, 6–12 in. high. Leaves 2·5–5 cm. l., 2–8 mm. br. Flowers generally solitary, stalked. Perianth 8–1 cm. l., green outside, crimson inside. Seeds black, about 1 mm. l.

“Tis pickled, and eat as English Sampier” (Sloane). Dr. Dancer speaks highly of the decoction as a gargle.

## 4. TRIANTHEMA L.

Diffuse prostrate herbs. Leaves opposite, entire, the pair unequal; petiole long, with a sheathing base. Flowers axillary with 2 bracteoles. Perianth with 5 lobes, mucronate near apex, coloured inside. Stamens 5 to many. Ovary free, of one carpel and one-celled (in W. Indian species); style one. Capsule one-celled with 6–8 seeds, circumsciss, the lid closed incompletely at

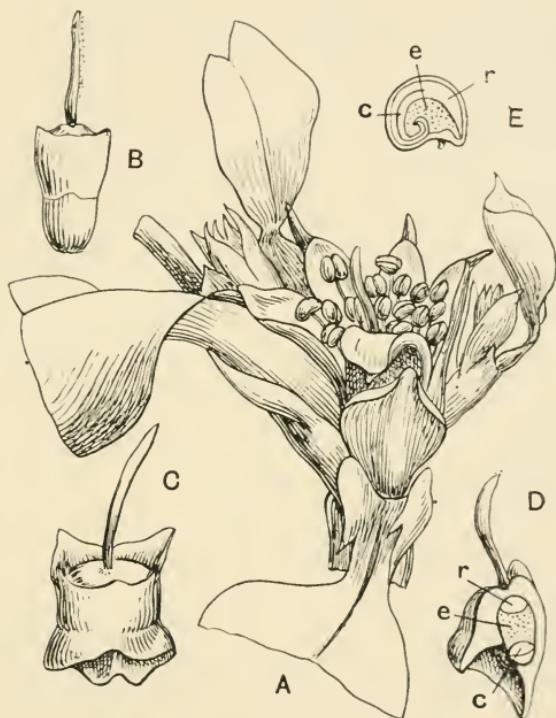


Fig. 62.—*Trianthema Portulacastrum* L.

A, Portion of shoot showing flower  $\times 5$ .

B, Ovary  $\times 10$ .

C, Upper part of fruit  $\times 10$ .

D, Do. cut lengthwise  $\times 10$ .

E, Seed in section  $\times 10$  ; e, endosperm ;

c, cotyledons ; r, radicle.

its base by a spurious transverse dissepiment, enclosing 1 (or 2) seeds. Embryo annular.

Species 17, widely distributed in the tropics.

**T. Portulacastrum** L. *Sp. Pl.* 223 (1753); *Urb. Symb. Aut.* iv. 231. **T. monogyna** L. *Mant.* 69 (1767); *Griseb. Fl. Brit. W. Ind.* 58. *Portulacæ affinis, folio subrotundo &c.* *Sloane Cat.* 89 & *Hist. i.* 205. Type in *Herb. Mus. Brit.* (Fig. 62.)

## Horse purslane (Sloane).

Spanish Town, Sloane Herb. iv. 9\*! Broughton! Rock Fort, Campbell! Fort Clarence Hill, Harris! Fl. Jam. 6307, 9538.—Keys of S. Florida, West Indies, tropical continental America, Africa, tropical Asia.

Stem 2-3 ft. long, perennial. Leaves roundish, to elliptical, somewhat cuneate at the base, variable in size, blade 1-5 cm. l. Flowers subsolitary, rosy or purplish within, half-concealed within the petiolar sheath. Perianth about .5 cm. l.

## FAMILY XX. PORTULACACEÆ.

Herbs, sometimes somewhat shrubby, fleshy. Leaves alternate or subopposite. Flowers solitary or crowded at the apex of the stems and branches, or in terminal panicles or racemes, regular, hermaphrodite. Sepals 2, adnate to the ovary at the base or free, deciduous or subpersistent. Petals 4-6, hypogynous or perigynous. Stamens inserted with the petals and often adnate to them at the base, indefinite. Ovary free or half inferior, 1-celled, with basal central placentation. Style with 3 to 7 stigmatic branches. Capsule circumsciss or 3-valved. Seeds numerous, kidney-shaped, compressed. Embryo curved round the endosperm.

Species 210, mostly American, some South African or Australian, very few in Asia, North Africa or Europe.

Flowers solitary or clustered at apex of branches. Ovary

half inferior ..... 1. *Portulaca*.

Flowers racemose or paniculate. Ovary free ..... 2. *Talinum*.

## 1. PORTULACA L.

Diffuse or ascending annuals. Uppermost leaves usually involucrate round the terminal flowers. Stipules scarious, minute or changed into hairs. Flowers solitary or crowded at the top of the stem and branches, yellow, purple or rosy, open only during the morning. Calyx deciduous. Petals 4-6, free, delicate. Stamens 8-25, inserted at base of petals. Ovary half-inferior; style deeply 5-7-partite. Capsule circumsciss.

Species 38, natives of the tropics; 2 species also in temperate regions.

Leaves obovate-cuneate or spatulate; axils with or without very short inconspicuous hairs..... 1. *P. oleracea*.

Leaves linear, linear-lanceolate, or subulate; axils with long hairs.

Stems more or less prostrate, branches undivided.

Petals purple ..... 2. *P. pilosa*.

Stems erect, branches numerous. Petals yellow.

Petals 3 mm. l. .... 3. *P. halimoides*.

Petals 5-7 mm. l. .... 4. *P. phaeosperma*.

1. *P. oleracea* L. *Sp. Pl.* 445 (1753); leaves obovate-cuneate or spatulate; axillary hairs (when present) few, very short, not conspicuous outside; seeds black, tuberculate, 8 mm. l.—*Haw. Succ.* 121; *DC. Prodr. iii.* 353; *A. Gr. Gen. t.* 99; *Macf. Jam. ii.* 166; *Griseb. Fl. Br. W. Ind.* 57; *Rohrb. in Fl. Bras. xiv. pt. 2,*

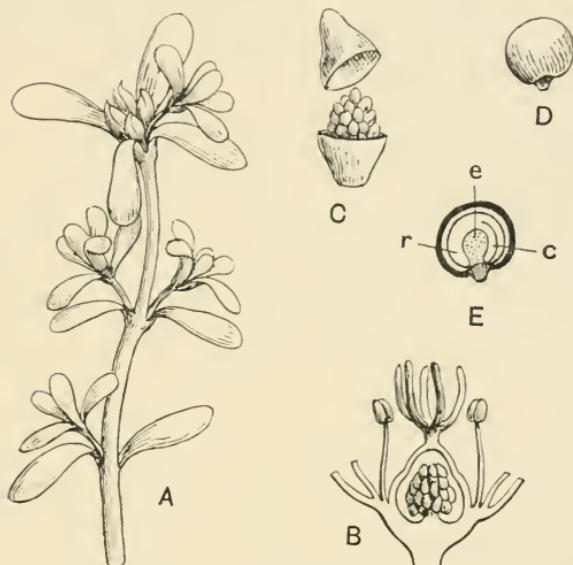


Fig. 63.—*Portulaca oleracea* L.

A, Upper portion of branch with flower-buds at apex  $\times \frac{2}{3}$ .

B, Flower in section with sepals and petals indicated  $\times 6$ .

C, Fruit after dehiscence  $\times 2$ .

D, Seed  $\times 10$ .

E, Do. in section  $\times 10$ ; e, endosperm; c, cotyledons; r, radicle.

299; *Urb. Symb. Ant.* iv. 232. *P. parvifolia* *Haw. Succ.* 122 (1812); *DC. tom. cit.*; *Macf. Jam. ii.* 167 (form with minute leaves). Type in *Herb. Linn.*

#### Purslane.

*Wright!* *Macfadyen!* *March!* Spanish Town road, *Campbell!* King's House, *T. Harris!* Great Pedro Bay, *Harris!*—Bahamas, West Indies, tropical and temperate regions.

Stems prostrate or somewhat erect, branching from the base, to 1 ft. high. Leaves varying very much in size, 5–4 cm. l. Flowers clustered or solitary. Sepals keeled, keel ending in a long point, 3–5 mm. l. Petals yellow, half as long again as the calyx. Stamens 7–12. Stigmas 3–5. Capsule covered by the withered corolla, 6 mm. l.

“It is a plant destitute of any odour, very fleshy and juicy and insipid to the taste, but it takes readily the taste of any viands or seasoning which may be combined with it, and in this manner an agreeable and palatable culinary preparation may be produced. It is also used with vinegar as a salad, and forms the ingredient of a soup. As a vegetable it has the reputation of being cooling, antiscorbutic, diuretic, &c., and peculiarly adapted for warm weather” (*Macfadyen*).

2. *P. pilosa* L. Sp. Pl. 445 (1753); stems prostrate, spread over the ground or ascending, branches undivided; leaves narrowly linear-lanceolate, acute, axillary hairs long, but shorter than the leaves; petals purple or crimson,  $1\frac{1}{2}$ –2 times as long as calyx; seeds black, with the surface granular, .6 mm. l.—*Haw. Succ.* 122; *Bot. Reg.* t. 792; *DC. Prodr.* iii. 354 (excl. var.); *Macf. Jam. ii.* 168; *Griseb. loc. cit.*; *Rohrb. tom. cit.* (in part); *Urb. tom. cit.* *Anacampseros supina* minor &c. *Browne Hist. Jam.* 234. Type in *Herb. Linn.*

Crimson-flowered Purslane.

*Browne*; Cays outside Port Royal, *Macfadyen*; March! Green Valley, 2000 ft., *Harris!* Fl. Jam. 6092.—Florida, Porto Rico, St. Thomas, St. Cruz, Antigua, Guadeloupe, Martinique, St. Vincent, Bequia, Mexico, tropical and subtropical parts of S. America.

Stems somewhat shrubby, to  $\frac{1}{2}$  ft. high. Leaves .5–1.5 cm. l. Flower-clusters surrounded by wool. Calyx, lobes not keeled, linear-oblong, obtuse, 2–3 mm. l. Petals  $1\frac{1}{2}$  to 2 times as long as the calyx. Stamens 15 or more, filaments crimson. Style 5-6-partite. Capsule covered by the withered corolla. Seeds .3 mm. in diam.

"The leaves are intensely bitter to the taste, and have been used as a diuretic and stomachic as well as an emmenagogue" (Macfadyen).

3. *P. halimoides* L. Sp. Pl. ed. 2, 639 (1762); stems somewhat erect, diffuse, branches numerous, arranged in a corymbose manner; leaves fleshy, subcylindrical, axillary hairs long, but shorter than the leaves; petals yellow, 3 mm. l., half as long again as the calyx, or less; seeds tuberculate, .4 mm. br.—*Haw. Misc.* 137; *DC. loc. cit.*; *Macf. Jam. ii.* 167; *Griseb. loc. cit.* *P. erecta* sedi &c. *Sloane Cat.* 88 & *Hist. i.* 205, t. 129, f. 3. *Halimus minimus* &c. *Browne Hist. Jam.* 206. Type in *Herb. Mus. Brit.*

Savanna Purslane.

Savannas, *Sloane Herb.* iv. 10! *Houstoun!* *Shakspear!* Spanish Town, Kingston, *Browne*; Kingston, *Macfadyen*; Pedro Bluff; Hope river mouth; *Harris!* Fl. Jam. 9942, 10,049.—Bahamas, Cuba, Porto Rico, St. Jan, St. Bartholomew, Antigua, Guadeloupe, Désirade, Saintes, Mexico.

Stems somewhat shrubby, 2–4 in. high. Leaves .6–.8 cm. l. Calyx 2–2.5 mm. l. Petals 3 mm. l. Stamens 8–20. Capsule circumsciss at  $\frac{1}{4}$ – $\frac{1}{3}$  of its height. Seeds black, .4 mm. br. "Towards Christmas, the naked heath-like stems may be observed, destitute of leaves, scarred, and bearing at the extremity of each branch an expanded cottony head, giving a rather remarkable and puzzling appearance" (Macfadyen).

4. *P. phæosperma* *Urb. Symb. Ant.* iv. 233 (1905); root thick; stems numerous, fleshy, branches numerous and parallel; leaves linear or oblong-linear, somewhat acute or obtuse; axillary hairs short; flower-clusters with dense hair; petals yellow, 5–7 mm. l., half as long again as the calyx, or less; seeds minutely and densely rough, .6 mm. br.—*Millspaugh in Field Columb. Mus. Bot. Ser. ii.* 298.

Road Kingston to Spanish Town; in crevices of honey-comb rock, Great Goat Is., *Harris!* Fl. Jam. 9104, 10,167.—Florida, Bahamas, Cuba, Hispaniola, Porto Rico, St. Cruz.

Stems somewhat shrubby, to 6 in. high. Leaves 5-1 cm. l. Calyx 4-5 mm. l. Petals 5-7 mm. l. Stamens 12-16. Style divided at  $\frac{1}{3}$  to  $\frac{2}{3}$  of its height into 5-7 linear branches. Capsule globulose, 2.5-3 mm. in diam., circumsciss at the middle or a little above. Seeds 23-35.

## 2. TALINUM Adans.

Glabrous herbs. Stipules wanting. Flowers in terminal panicles or racemes. Sepals herbaceous, deciduous or sub-

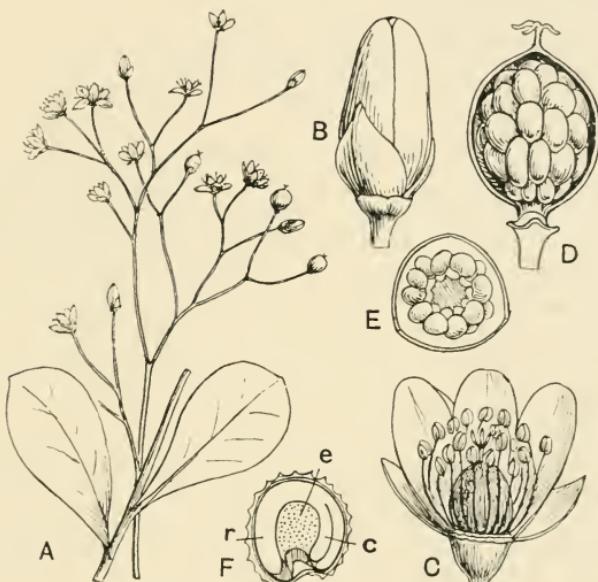


Fig. 64.—*Talinum paniculatum* Gaertn.

A, Upper portion of flowering shoot  $\times \frac{1}{2}$ . D, Capsule with part of the wall removed  $\times 5$ .  
 B, Bud  $\times 5$ . E, Do, cut across  $\times 5$ .  
 C, Flower with part of the sepals and two of the petals removed  $\times 5$ . F, Seed in section  $\times 10$ ; e, endosperm; c, cotyledons; r, radicle.

persistent. Petals 5. Stamens 10-30, adherent to the base of the petals. Ovary free, style trifid. Capsule 3-valved.

Species about 19, natives of warm regions.

Inflorescence paniculate. Flowers not exceeding  $\frac{1}{2}$  in. l..... 1. *T. paniculatum*.  
 Inflorescence generally racemose. Flowers exceeding  $\frac{1}{4}$  in. l..... 2. *T. triangulare*.

1. *T. paniculatum* Gaertn. *Fruct. ii.* 219 *t.* 128 (1791); pedicels terete; sepals deciduous.—*Urb. Symb. Ant.* *iv.* 231. *T. patens* Willd. *Sp. Pl. ii.* 863 (1800); *Griseb. Fl. Br. W. Ind.* 57; *Rohrb. in. Fl. Bras. xiv. pt. 2*, 296, *t.* 67. *T. fruticosum*

*Macf. ii.* 169. *Portulaca paniculata* *Jacq. Enum. Pl. Carib.* 22 (1760); *Sel. Stirp. Amer.* 148 & *Ed. pict.* t. 136 (non *L.*). *P. patens* *L. Mant.* 242 (1771); *Jacq. Hort. Vindob.* *ii.* 71, t. 151 (1772). Specimen from Jacquin in *Herb. Mus. Brit.* (Fig. 64.)

*Broughton!* Sea-side; roadsides in the mountains, *Macfadyen*; *Distin!* *March!* August Town, 550 ft., *Campbell!* near Hope, 700 ft., *Harris!* *Graham!* Mavis Bank, *Fawcett!*—Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, Guadeloupe, Martinique, St. Vincent, Bequia, Barbados (cult.), Grenada, Margarita, tropical continental America.

*Stems* somewhat shrubby, erect from a tuberous root, 1-2½ ft. high. *Leaves* thick, elliptical, tapering to the stalk-like base, 4-8 cm. l., 2-4 cm. br. *Flowers* in a terminal panicle, of which the branches are cymes. *Sepals* 3-4 mm. l. *Petals* rosy or yellow, ephemeral, 4-5 mm. l. *Stamens* 15-20. *Seeds* black, minutely striolate.

2. *T. triangulare* *Willd. Sp. Pl. ii.* 862 (1800); pedicels with 3 angles; sepals persistent.—*Haw. Succ.* 123; *Macf. Jam. ii.* 169; *Griseb. op. cit.* 56; *Urb. loc. cit.* *T. racemosum* *Rohrb. tom. cit.* 297 (1872). *Helianthemum frutescens*, *Portulacæ folio*, *Plum. Cat.* 7 & *Pl. Amer. (Burm.)* t. 150, f. 2. *Portulaca triangularis* *Jacq. Enum. Pl. Carib.* 22 (1760) & *Hort. Vindob.* *iii.* t. 52. *P. racemosa* *L. Sp. Pl.* 640 (1762).

*Distin!* Long Mt., 30 ft.; Pedro Plain; *Harris!* Fl. Jam. 9601, 9938.—Porto Rico, St. Thomas, St. Cruz, St. Bartholomew, Guadeloupe, Martinique, Grenada, Margarita, S. America.

Succulent plant. *Stems* somewhat shrubby, erect, simple or much branched if broken down to the branching root, to 2 ft. high. *Leaves* obovate-lanceolate or oblanceolate, 2-4(-6) cm. l., 1-1.5(-2.5) cm. br. *Flowers* in a raceme, either simple and few-flowered, or long, branching and many-flowered. *Sepals* 5 mm. l. *Petals* yellow, sometimes rosy or white, roundish-elliptical, 8-9 mm. l., 6 mm. br., 10-12 mm. in diam. *Stamens* about 30. *Seeds* black, minutely striolate.

## FAMILY XXI. BASELLACEÆ.

Glabrous herbs with twining stems. Leaves alternate, entire. Flowers small, regular, hermaphrodite, in axillary spikes or panicles. Bract one at base of the pedicel. Bracteoles 2 at apex of the pedicel, small. Sepals 2, sometimes adnate to the base of the corolla. Corolla 5-partite. Stamens 5, inserted on a hypogynous disk adnate to the base of the corolla, opposite to the petals; anthers versatile, filaments (in West Indian species) reflexed in bud. Ovary free, 1-celled, with one erect short-stalked ovule. Style short; stigmas 3, thickened towards the apex, obtuse or 2-3-lobed. Seed erect. Embryo (in West Indian species) semiannular, surrounding the endosperm.

Species about 15, mostly American.

- Sepals not winged in fruit..... 1. *Boussingaultia*.
- Sepals winged in fruit..... 2. *Anredera*.

## 1. BOUSSINGAULTIA H. B. &amp; K.

Root perennial. Flowers in axillary and terminal branching racemes. Sepals oblong, obtuse, somewhat shorter than the corolla and adnate to its base, not changing in fruit. Petals spreading. Stigmas obtuse. Cotyledons broad, plano-convex.

Species 10, natives of tropical America.

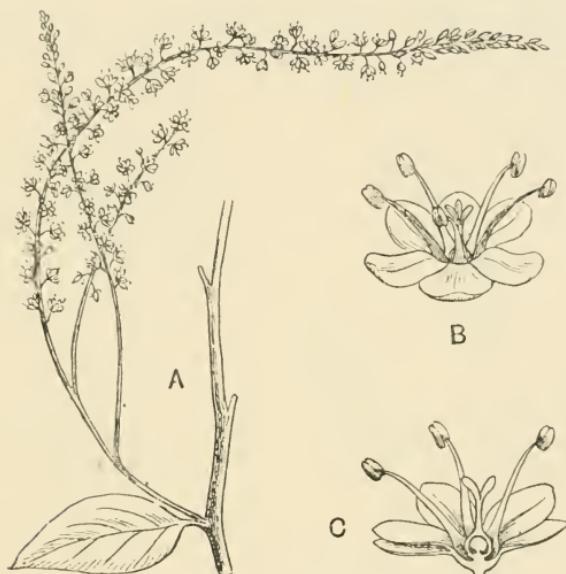


Fig. 65.—*Boussingaultia leptostachys* Moq.

A, Portion of flowering branch  $\times \frac{2}{3}$ . C, Do. cut lengthwise  $\times 3$ . (B and C after Baillon.)  
B, Flower of *B. baselloides* H. B. & K.  $\times 3$ .

*B. leptostachys* Moq. in *DC. Prodr. xiii. pt. 2, 229 (1849); Urb. Symb. Ant. iv. 233.* (Fig. 65.)

Near Kingston, 250 ft.; *Campbell!* Fl. Jam. 5703.—Hispaniola, Porto Rico, St. Thomas, St. Cruz, Guadeloupe, Martinique, Mexico, Yucatan, Brazil.

Leaves ovate or ovate-elliptical, 2-6 cm. l., 1.5-4 cm. br.; stalks 4-7 mm. l. Racemes lax, much longer than the leaves. Bracts 1.5 mm. l., linear-acuminated. Pedicels about 1 mm. l. Flowers white. Bracteoles .6 mm. l., triangular-cuspidate. Sepals 1-nerved, keeled. Petals about 2 mm. l. Styles 1 mm. l.

*Basella alba* L. and *B. rubra* L. are cultivated in many tropical countries, the tender, succulent leaves making a good "spinach."

## 2. ANREDERA Juss.

Root tuberous. Flowers in simple or branched racemes. Sepals enclosing the petals, keeled, and in fruit broadly winged along the back. Stigmas broadened upwards, or 2-lobed. Cotyledons subclavate.

Species 1, native of subtropical America from Texas to Peru, including West Indies.

*A. scandens* Moq. in DC. *Prodr. xiii. pt. 2*, 230 (1849); Griseb. *Fl. Br. W. Ind.* 60; Volkens in Engl.-Prantl *Pflzfam.*

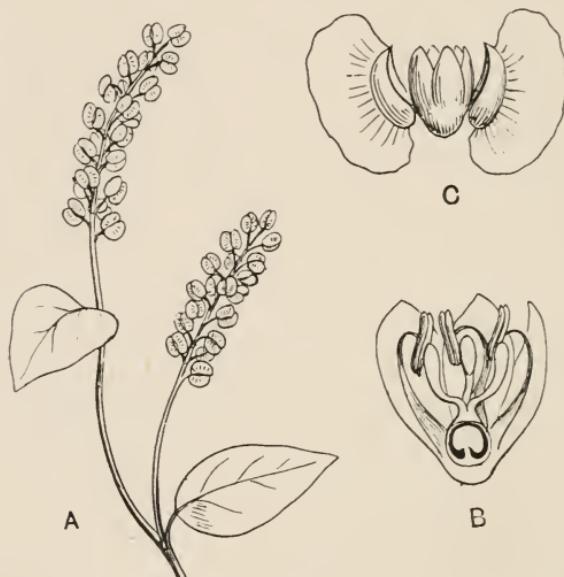


Fig. 66.—*Anredera scandens* Moq.

A, Portion of fruiting branch  $\times \frac{2}{3}$ .

B, Flower cut lengthwise  $\times 10$ .

C, Fruit showing the winged calyx  $\times 5$ .

(B and C after Volkens in Engl.-Prantl *Pflzfam.*)

iii. pt. 1, a, 128. *Fegopyrum scandens* seu *volubilis* &c. Sloane Cat. 46 & Hist. i. 138, t. 90, f. 1. *Polygonum scandens* L. Sp. Pl. 364 (1753). Type in Herb. Linn.

Near Spanish Town, Sloane Herb. ii. 103!—Cuba, subtropical America. Leaves ovate, sometimes narrowing at the base, to 8.5 cm. l., 6 cm. br.; lower obtuse, very shortly acuminate, upper oblong-ovate, long acuminate. Peduncles 6–20 mm. l. Spikes longer than the leaves, 2–13 cm. l., densely flowered. Sepals in flower about 2 mm. l., wing in fruit about 4 mm. l. Petals about 2 mm. l.

Cultivated in Spain, Egypt and Philippines.

## FAMILY XXII. CARYOPHYLLACEÆ.

Herbs. Leaves opposite, entire, generally united at the base by a transverse line, without stipules or with small scarious stipules. Inflorescence cymose. Flowers regular, hermaphrodite. Sepals 4-5, persistent. Petals as many as sepals. Stamens 8-10 or fewer, inserted with the petals. Receptacle small, or elongated and bearing the stamens at its apex under the ovary, or forming an annular disk bearing the stamens. Ovary free, 1-celled, or rarely 2-5 celled at the base. Styles 2-5, free or united below. Ovules numerous. Capsule dehiscing by valves or teeth at apex. Embryo curved surrounding the endosperm; cotyledons narrow.

Species about 1450, mostly occurring in temperate regions of the northern hemisphere, but also in the southern hemisphere, and a few in mountains of the tropics.

Sepals free or very shortly united at base.

- Style simple below, divided into 3 above..... 1. *Drymaria*.
- Styles distinct from base.
  - Stipules none.
    - Petals entire..... 2. *Arenaria*.
    - Petals 2-lobed.
      - Styles 5..... 3. *Cerastium*.
      - Styles 3..... 4. *Stellaria*.
  - Stipules small, scarious..... 5. *Spergula*.
  - Sepals united into a tubular toothed calyx..... 6. *Silene*.

## 1. DRYMARIA Willd.

Herbs. Leaves with small scarious stipules. Flowers in terminal cymes. Sepals 5. Petals 5, 2-fid. Stamens 5-2, opposite the sepals. Ovary 1-celled; style simple at the base, 3-fid above. Capsule 3-valved.

Species about 47, natives of tropical and subtropical America, one also dispersed through tropics of the Old World.

**D. cordata** Willd. ex Roem. & Schult. Syst. v. 406 (1819); Macf. Jam. i. 53; Griseb. Fl. Br. W. Ind. 56; Rohrb. in Fl. Bras. xiv. pt. 2, 259, t. 60; Urb. Symb. Ant. iv. 234. D. diandra Macf. Jam. i. 52. Holosteum cordatum L. Sp. Pl. 88 (1753). H. diandrum Sw. Prodr. 27 (1788), Icon. t. 7 & Fl. Ind. Occ. 221. Alsine americana nummulariae &c. Sloane Cat. 87 & Hist. i. 203. Holosteum foliis orbiculatis &c. Browne Hist. Jam. 139. H. dian-drum &c. Browne loc. cit. Type in Herb. Linn. (Fig. 67.)

West Indian Chickweed.

Sloane Herb. iv. 8! Houston! Swartz! Macfadyen! March! Blue Mts., Fawcett! Devon Pen, 300 ft., Thompson! Hope Gardens, Harris! Fl. Jam. 7958, 8444.—West Indies, tropics.

Annual. Leaves roundish, subcordate at base, sometimes kidney-shaped, variable in size, 2 mm.-2 cm. br. Sepals lanceolate-elliptical, variable in size, 2-3.5 mm. l. Petals shorter than sepals, deeply bifid. Capsule shorter than the calyx. Seeds 8-2, granulose, about 1 mm. l.

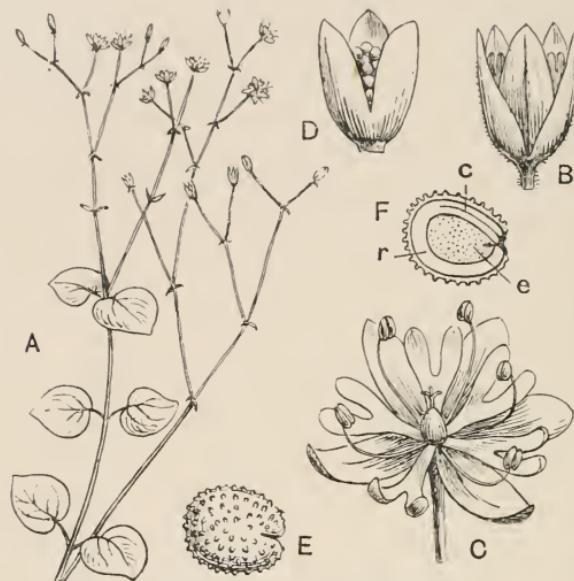


Fig. 67.—*Drymaria cordata* Willd.

A, Apex of branch  $\times \frac{2}{3}$ .

B, Flower-bud opening  $\times 5$ .

C, Do. open  $\times 5$ .

D, Capsule open  $\times 5$ .

E, Seed  $\times 12$ .

F, Do. cut lengthwise  $\times 12$ ; e, endosperm; c, cotyledons; r, radicle.

## 2. ARENARIA L.

Herbs. Flowers in terminal leafy, paniculate cymes or solitary, axillary. Sepals 5. Petals 5, entire. Stamens 10, inserted on a disk. Ovary 1-celled; styles 3. Capsule with 3 deeply-divided, as it were six, valves. Sandwort.

Species 100, natives of the whole world, but rare in the tropics except in the mountains.

A. lanuginosa Rohrb. in *Fl. Bras.* xiv. pt. 2, 274, t. 63 (1872); Williams in *Journ. Linn. Soc.* xxxviii. 377. *Spergularium lanuginosum* Michx. *Fl. Bor. Am.* i. 275 (1803). *Stellaria elongata* Mitt. *Gen. Amer.* i. 289 (1818); DC. *Prodr.* i. 399. *Arenaria diffusa* Ell. *Sketch* i. 519 (1818); Macf. *Jam.* i. 54; Griseb. *Fl. Br. W. Ind.* 55. (Fig. 68.)

Mountains, Bancroft! Macfadyen! McNab! Wilson! Morris! McNeil's Estate, 2,500 ft., Eggers!—Bermuda, America from North Carolina to Patagonia.

Annual. Stem lax, procumbent, puberulous. Leaves linear or lanceolate or oblong-lanceolate, acute, narrowed to base, .5-3 cm. l. Sepals keeled, acuminate, about 4 mm. l. Petals slightly longer or shorter than the sepals, rarely absent. Seeds lens-shaped, smooth, less than 1 mm. in diam.

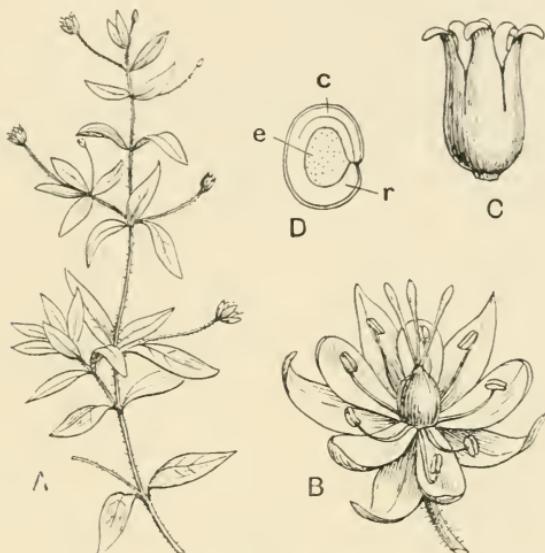


Fig. 68.—*Arenaria lanuginosa* Rohrb.

A, Apex of branch  $\times \frac{2}{3}$ .  
 B, Flower  $\times 4$ .  
 C, Capsule open  $\times 4$ .

D, Seed cut lengthwise  $\times 8$ ; e, endosperm; c, cotyledons; r, radicle.

### 3. CERASTIUM L.

Herb. Flowers in terminal dichotomous cymes, often contracted. Sepals 5. Petals 5, 2-fid. Stamens 10. Ovary 1-celled; styles 5, distinct from base, opposite the sepals. Capsule cylindrical, dehiscing at apex by 10 teeth, many-seeded.

Species about 100, natives of the whole world, but confined to mountains in the tropics.

*C. viscosum* L. *Sp. Pl.* 437 (1753); *Gren. Cer.* 25; *Griseb. Fl. Br. W. Ind.* 55; *Rohrb. in Fl. Bras.* xiv. pt. 2, 279. *C. glomeratum* *Thuill. Fl. Paris.* ed. 2, 226 (1799); *Syme Engl. Bot. ed. 3, ii. 82, t. 221.* *C. spathulatum* *Pers. Syn. i. 520: Macf. Jam. i. 55.* (Fig. 69.) Type in *Herb. Linn.*

Mouse-Ear Chickweed.

Catherine's Peak, Macfadyen; March; Blue Mt. Peak, J.P. 2028,

*Morris!*—Temperate Europe and Asia, also found in many parts of the world in temperate climates and on mountains of the tropics.

Annual, glandular-pubescent. Stems ascending. Leaves oblong-lanceolate or obovate-spathulate, 1–2 cm. l. Pedicels shorter generally than the calyx. Bracts herbaceous. Calyx 4–5 mm. l. Capsule about 9 mm. l., teeth straight. Seeds tuberculate.

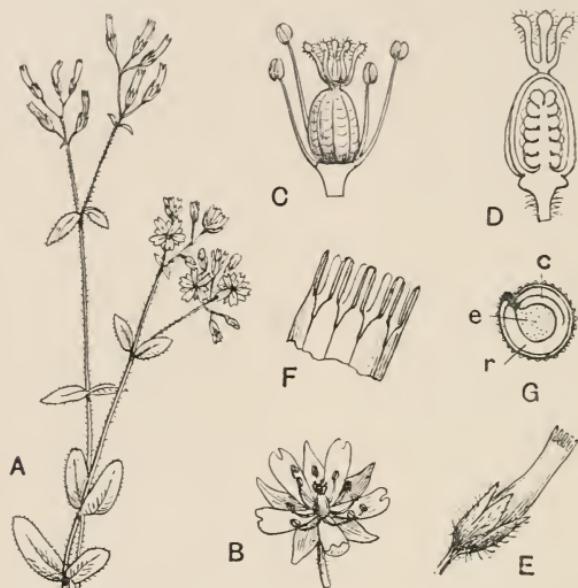


Fig. 69.—*Cerastium viscosum* L.

A, Apex of branch  $\times \frac{2}{3}$ .

B, Flower  $\times 2$ .

C, Ovary and four stamens  $\times 4$ .

D, Ovary cut lengthwise  $\times 6$ .

E, Capsule  $\times 2$ .

F, Apex of capsule  $\times 6$ .

G, Seed cut lengthwise  $\times 10$ ; e, endosperm; c, cotyledons; r, radicle.

#### 4. STELLARIA L.

Herbs. Flowers axillary or in terminal cymes. Sepals 5. Petals 5, 2-partite. Stamens 10, inserted on a disk. Ovary 1-celled; styles 3, distinct from base. Capsule 6-valved.

Species 100, natives of the whole world but only on mountains in the tropics.

*S. media* Vill. *Dauphin.* iii. 615 (1789); *Macf. Jam.* i. 54; *Griseb. Fl. Br. W. Ind.* 55; *Syme Engl. Bot. ed. 3, ii.* 93, t. 229; *Rohrb. in Fl. Bras.* xiv. pt. 2, 276, t. 64, II. *Alsine media* L. *Sp. Pl.* 272 (1753). Type in *Herb. Linn.* (Fig. 70.)

##### Chickweed.

Mountains, *Macfadyen*; Lancaster, *Harris & Britton!* *Fl. Jam.* 10, 544.—Arctic and N. temperate regions, in mountains in tropics.

Annual. Stem diffuse, procumbent, with a pubescent line down one side. Leaves ovate or broadly-elliptical, glabrous, 5-3 cm. l. Flowers long-stalked. Sepals somewhat obtuse, 3-4 mm. l. Petals a little shorter. Stamens 10-3. Capsule a little longer than the calyx. Seed 1 mm. l.

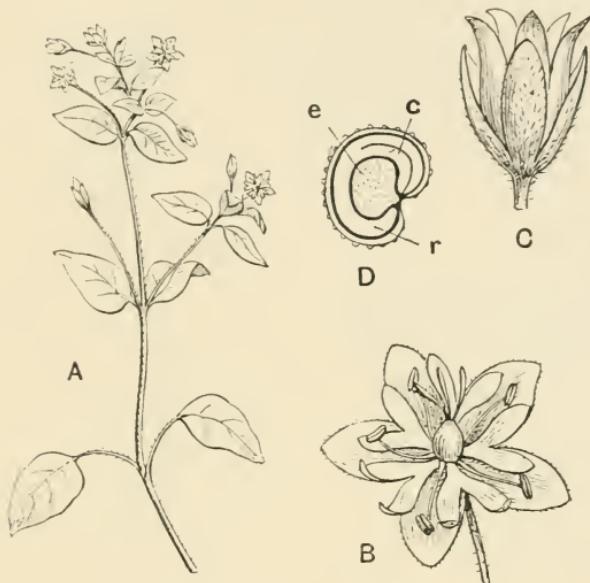


Fig. 70.—*Stellaria media* Vill.

A, Apex of branch  $\times \frac{2}{3}$ .  
B, Flower  $\times 4$ .  
C, Capsule open  $\times 4$ .

D, Seed cut lengthwise  $\times 20$ ; e, endosperm; c, cotyledons; r, radicle.

### 5. SPERGULA L.

Annual herbs branching dichotomously or in whorls. Leaves narrowly linear or thread-like, whorled. Stipules small, ovate, scarious. Flowers stalked in dichotomous cymes. Calyx 5-partite. Petals 5, entire. Stamens 5 or 10. Ovary 1-celled; styles 5, alternate to sepals. Capsule 5-valved, valves entire, opposite the sepals. Seeds acutely margined or winged.

Species 2 or 3, natives of Europe and temperate Asia, one found in cultivated land almost all over the world.

*S. arvensis* L. *Sp. Pl.* 440 (1753); *Syme Engl. Bot. ed. 3, ii.* 126, *tt.* 252, 253; *Rohrb. in Fl. Bras. xiv. pt. 2,* 263, *t.* 58, *f. III.* (Fig. 71.)

Corn Spurrey.

Portland Gap, 5550 ft., Morris! Abbey Green, Harris!—In temperate climates and mountains of the tropics of northern hemisphere.

Erect annual. Leaves 1·5-3·5 cm. l., not quite 1 mm. br. Sepals 2·5-3 mm. l. Petals a little longer than the sepals. Seeds black, about 1 mm. l.

Said to be good fodder for cattle, sheep and poultry.

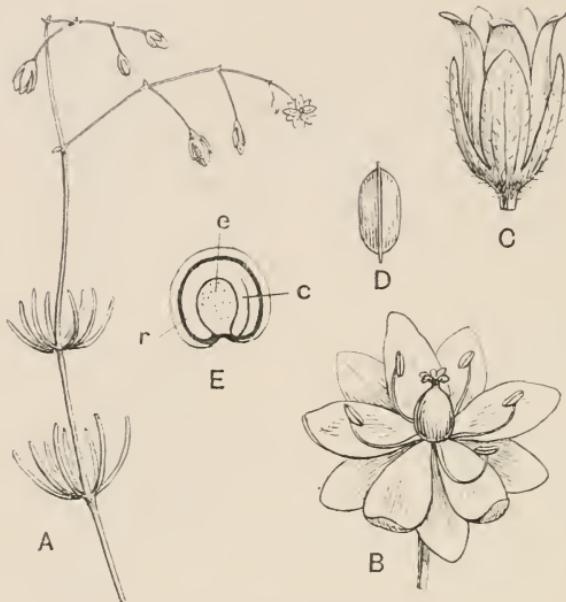


Fig. 71.—*Spergula arvensis* L.

A, Apex of branch  $\times \frac{5}{2}$ .  
B, Flower  $\times 5$ .  
C, Capsule open  $\times 5$ .

D, Seed seen edgewise  $\times 15$ .  
E, Seed cut lengthwise  $\times 15$ ; e, endosperm; c, cotyledons; r, radicle.

## 6. SILENE L.

Herbs. Calyx tubular, 5-toothed, 10-nerved. Petals 5, with a narrow claw, and with or without a corona. Stamens 10. Receptacle elongated above the petals. Ovary 1-celled; styles 3, distinct from base. Capsule 3-4-celled at base, dehiscing at apex by six teeth. Embryo peripheral. Catch-fly.

Species 300, natives of Europe, temperate and subtropical Asia, Africa and America.

Plant villose. Flowers racemose ..... 1. *S. gallica*.  
Plant glabrous. Flowers corymbose ..... 2. *S. Armeria*.

1. *S. gallica* L. *Sp. Pl.* 417 (1753) form *quinquevulnera* *Rohrb.* *Sil.* 96 (1868); villose; leaves sessile, oblanceolate; flowers racemose; petals red or purple with a white edge; corona-scale white, bifid.—*Rohrb.* *Fl. Bras.* xiv. pt. 2, 290;

Williams in *Journ. Linn. Soc.* *xxxii.* 57; Griseb. *Fl. Br. W. Ind.* 55 (as *S. gallica L.*). *S. quinquevulnera L. Sp. Pl.* 416 (1753); Macf. *Jam. i.* 51. (Fig. 72.)

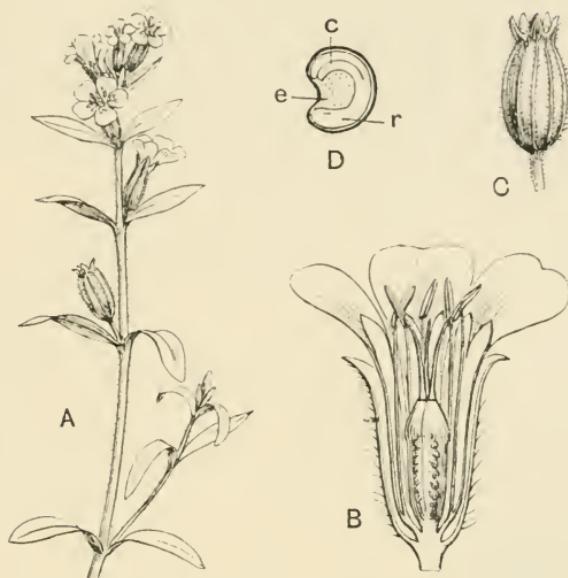


Fig. 72.—*Silene gallica L. form quinquevulnera Rohrb.*

A, Portion of stem  $\times \frac{2}{3}$ .

B, Flower with part of the calyx and corolla cut off, and ovary added from a flower in a later stage with ripening seeds  $\times 3$ .

C, Fruit covered by the persistent calyx  $\times 2$ .

D, Seed cut lengthwise  $\times 10$ ; e, endosperm; c, cotyledons; r, radicle.

Catherine's Peak, Macfadyen; McNab! Cinchona, J.P. 1403, Hart!—Indigenous in central and southern Europe, and occurring all over the world apparently spontaneously.

Stem 1 ft. and more high. Leaves about 2 cm. l. Flowers about 1 cm. l. Calyx 8 cm. l. in flower increasing in fruit and a little longer than the capsules (8 cm. l.).

2. *S. Armeria L. Sp. Pl.* 420 (1753); glabrous; leaves (of the stem) sessile, broadly lanceolate or oblong-lanceolate, subcordate at the base; flowers corymbose; petals deep rosy-pink, corona-scale of same colour, bisected.—Williams *tom. cit.* 108.

Blue Mts., Morris! Cinchona; Clydesdale; Harris! Fl. Jam. 9598.—Indigenous in central and southern Europe, and occurring in many parts of the world apparently more or less spontaneously.

Stem 1 ft. and more high. Leaves 3-5 cm. l., semi-amplexicaul. Flowers about 2 cm. l. Calyx about 1.6 cm. l. in flower, and 1.8 cm. l. in fruit, a little longer than the capsule.

## FAMILY XXIII. NYMPHÆACEÆ.

Aquatic herbs with rhizome bearing peltate leaves and one-flowered scapes. Flowers large and showy. Sepals usually 4. Petals and stamens numerous, inserted on the receptacle, with which the carpels are often united. Anthers dehiscing inwards; connective continuous with the filament and sometimes produced. Carpels numerous, free or united. Ovules pendulous. Seeds often with an aril, with or without perisperm and endosperm; cotyledons thick; radicle very short.

Species about 53, found all over the world.

Leaves and flowers floating. Leaves cleft nearly to the centre ..... 1. *Nymphaea*.  
 Leaves and flowers raised above the water. Leaves not cleft ..... 2. *Nelumbo*.

## NYMPHÆA L.

Leaves and flowers floating. Leaves cleft nearly to the centre. Petals (passing gradually into stamens) and stamens in

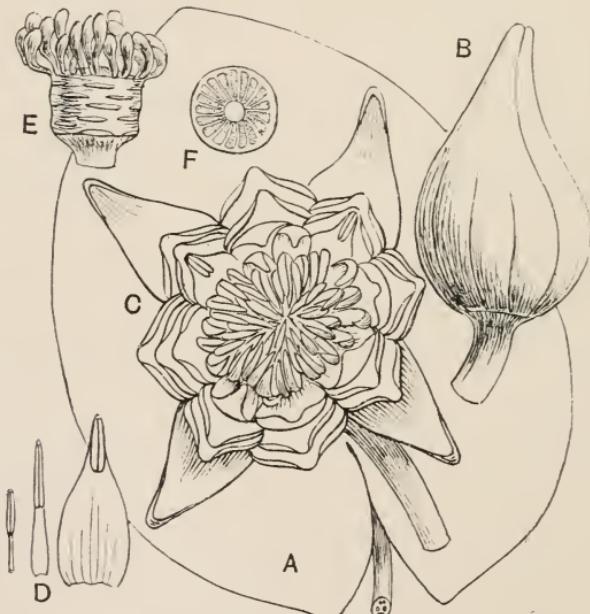


Fig. 73.—*Nymphaea amazonum* Mart. & Zucc.

A, Leaf  $\times \frac{1}{4}$ – $\frac{1}{3}$ .  
 B, Unopened flower  $\times \frac{1}{2}$ .  
 C, Flower  $\times \frac{1}{2}$ .

D, Anthers showing variation from the innermost to the outermost  $\times \frac{2}{3}$ .  
 E, Ovary with scars of petals, and bearing the styles  $\times \frac{2}{3}$ .  
 F, Ovary cut across  $\times \frac{2}{3}$ . (After Conard.)

many series on the receptacle. Filaments petaloid, the outer broad with small anthers, the inner narrow with longer anthers. Carpels immersed in the fleshy receptacle, and united with it into a many-celled, half-inferior ovary. Ovules numerous, pendulous from the cell-walls. Berry spongy, ripening under water, and then breaking irregularly. Seeds immersed in the pulp, with a sack-like aril open at the apex, and with a large perisperm in addition to the small endosperm.

Species 32, natives chiefly of the northern hemisphere and tropics, but found also in South Africa and Australia.

Flowers diurnal. Connective appendaged..... 1. *N. ampla*.

Flowers nocturnal. Connective not appendaged.

Leaves with entire margin ..... 2. *N. amazonum*.

Leaves with sinuate-dentate margin ..... 3. *N. Rudgeana*.

§ 1. Flowers diurnal, raised above the water ; connective of outer anthers produced into an appendage ; carpels free from one another at the sides ; styles short, conical, narrowed to apex, stiff and fleshy.

1. *N. ampla* *DC. Syst. ii.* 54 (1821) ; *Macf. Jam. i.* 19 ; *Griseb. Fl. Br. W. Ind.* 11 ; *Conard Waterlilies* 134, *t. 5*. *N. ampla* var. *Plumieri* *Planch. in Ann. Sc. Nat. sér. 3, xix.* 44 (1853) ; *Casp. in Fl. Bras. iv. pt. 2,* 156, *tt.* 28–30 ; *Urb. Symb. Ant. iv.* 235. *N. indica* flore candido in ambitu serrato *Sloane Cat.* 120 & *Hist. i.* 252. *N. foliis amplioribus &c.* *Browne Hist. Jam.* 243. *N. Lotus L. Sp. Pl.* 511 (1753) (so far as regards American specimens).

Lagoons, Caymanas, *Sloane* ; lagoons beyond Ferry, *Browne* ; *Shakspear* ! Ferry & St. George, *Macfadyen* ! “Alligator Pond, St. George,” *Osborne* ! *March* ! near Spring Garden, *Espeut* ! Mitcham, St. Elizabeth, *Key* ! Ferry, *Fawcett & Harris* ! *Fl. Jam.* 7933.—Central America and West Indies from 14° to 26° n. lat.

Leaves 15–40 cm. br., roundish, peltate, sinuate-toothed or nearly entire, lobes acute, under-surface red-purple. Flowers white, 7–18 cm. br. Sepals oblong-lanceolate, outer surface green marked with blackish lines. Petals 7–21, oblong-lanceolate, outermost tinged yellowish-green. Stamens 90–190, yellow, outermost much longer than innermost. Carpels 14–23. The petals are arranged in an indefinite spiral on the receptacle, and the stamens follow similarly without much interval.

Var. *speciosa* *Casp. tom. cit.* 158, *t.* 29, *f.* 1–9, *t.* 30, *f.* 1 ; of medium size ; leaves not large nor very leathery, with wavy or toothed margin, the teeth obtuse, nerves beneath not prominent, stamens 40–130.—*Urb. loc. cit.* *Conard op. cit.* 136. *N. speciosa* *Mart. & Zucc. in Abh. Akad. Muench. i.* 361 (1832).

*Dancer* ! *Macfadyen* ; *Wilson* !—West Indies and Tropical America from 19° n. lat. to 23° s. lat. “This is the form cultivated in Europe as *N. ampla* sent to Kew from Jamaica by Macfadyen in 1847 or 1848, and to Caspary from Caracas by Dr. Ernst in 1869” (Conard).

Var. *pulchella* *Casp. tom. cit.* 159, *t.* 30, *f.* 2-10; flowers of medium to small size; stamens 30 to 50; leaves with margin sub-entire or slightly repand-sinuate, veins slender scarcely prominent.—*Conard op. cit.* 136. *N. pulchella* *DC. Syst. i.* 51 (1821).

Pond half-way between May Pen and Chapelton, *Harris!* *Fl. Jam.* 11,002.—Bahamas, Cuba, Vieques, St. Cruz, South America from  $2^{\circ}$  s. lat. to  $23^{\circ}$  s. lat.

*Leaves* 12-17 cm. l., 9-14 cm. br. *Petals* 3 cm. l.

§ 2. Flowers floating, nocturnal; petals in whorls of 4, alternate with the sepals and with each other, the stamens continue the arrangement, the outer 4 or 8 being somewhat petaloid; anthers without an appendage; carpels not free from one another; styles slender with enlarged club-shaped tips.

2. *N. amazonum* *Mart. & Zucc. in Abh. Akad. Muench. i.* 363 (1832); leaves, margin entire, petiole bearing a ring of long hairs at top.—*Casp. tom. cit.* 165, *t.* 35, *f.* 3-15; *Urb. loc. cit.*; *Conard op. cit.* 200, *t.* 19. *N. blanda* *Macf. loc. cit.* (excl. syn.). *N. Rudgeana* var. *amazonum* *Griseb. op. cit.* 12. (Fig. 73.)

Spanish Town, *Dr. D. Moore*; Montpelier, St. Thomas in the East, *Macfadyen*.—Porto Rico, Guadeloupe, Colombia, Guiana, Surinam, Brazil.

*Leaves* (mature), to 17 cm. l., to 14 cm. br., roundish-ovate, peltate, lobes rounded; under surface brownish-red. *Flowers* yellowish-white, 7.5-15 cm. br. *Sepals* elliptical, acuminate, about 5 cm. l. *Petals* 16-20, ovate to oblong, 3-4.5 cm. l. *Stamens* 93 to 297 (Caspar), 2- nearly 3 cm. l. *Carpels* 25-35. *Fruit* subspherical with the sepals and outer petals attached loosely round it, nearly 4 cm. in diam.

3. *N. Rudgeana* *G. F. W. Meyer Prim. Fl. Esseq.* 198 (1818) (excl. syn. Sloane and Browne); leaves, margin sinuate-dentate, petiole quite glabrous.—*Griseb. op. cit.* 11 (excl. syn.) *Casp. tom. cit.* 160; *Conard op. cit.* 204, *t.* 20. *N. blanda* *Planch. op. cit.* 47 (non *G. F. W. Meyer*).

Spanish Town, *Dr. D. Moore*; St. Elizabeth, *March!*—Martinique, Guiana, Surinam, Brazil.

*Leaves* (mature) elliptical to roundish, to 40 cm. l. *Flowers* greenish-yellow, 6.5-15.5 cm. br. *Sepals* oblong-ovate, 3.5 cm. l. *Petals* 12-32, elliptical to oblong-lanceolate, 2.5-3.5 cm. l. *Stamens* 40-80 inserted at the summit of the receptacle, 1.3-2.3 cm. l. *Carpels* 11-24. *Fruit* bearing the funnel-shaped stigma, surrounded by the persistent sepals, petals and stamens, about 4 cm. in diam.

Hemsley (*Biolog. Central.-Amer. Bot. i.* 25) quotes *N. blanda* Meyer as from Jamaica, but the specimen in *Herb. Kew.* (a cultivated one from Hort. Glasnevin received from Jamaica), on which probably this citation is based, is *N. blanda* *Planch. (non Meyer)*.

## NELUMBO Adans.

Leaves and flowers raised out of the water. Leaves not cleft, peltate. Sepals, petals and stamens inserted at the base of the receptacle. Connective of anthers produced into a blunt appendage. Carpels enclosed singly in pits scattered irregularly on the flat top of the obconical fleshy receptacle. Ovules 1 or 2 in the carpels, pendulous from the apex. Nuts projecting from

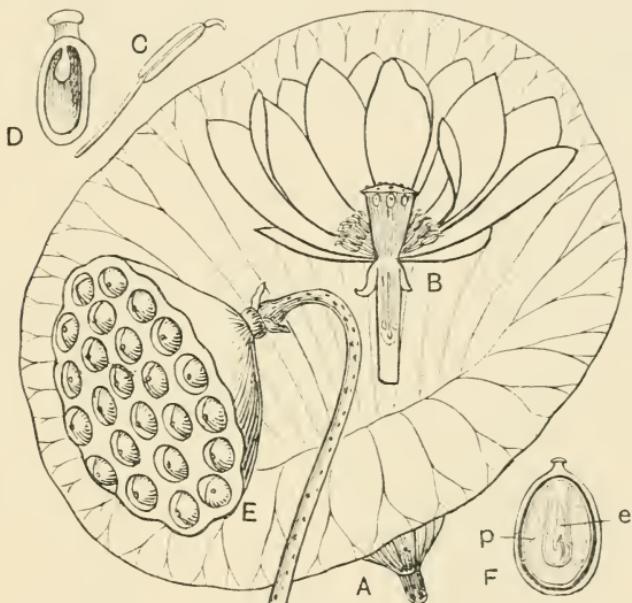


Fig. 74.—*Nelumbo jamaicensis* DC.

A, Leaf  $\times \frac{1}{2}$ .  
 B, Flower cut lengthwise  $\times \frac{1}{4}$ .  
 C, Anther, nat. size.  
 D, Carpels detached with the ovary cut lengthwise  $\times \frac{1}{2}$ .  
 E, Receptacle in ripe fruit.  $\times \frac{1}{2}$ .  
 F, Fruit cut lengthwise, nat. size; p, cotyledon; e, plumule.  
 (A, B, C, E after Bull. Bot. Dep. Dep. Jamaica.)

the pits in the receptacle. Seeds without perisperm and endosperm; cotyledons enclosing a well developed plumule.

Species 3, one N. American, another Jamaican, and the third Old World.

*N. jamaicensis* DC. *Syst. ii.* 47 (1821) (*Nelumbium*); Macf. *Jam. i.* 18 & *Descr.* (ined.). *N. lutea* Casp. in *Fl. Bras. iv. pt. 2*, 133 (in part). *Nelumbium luteum* Willd. *Sp. Pl. ii.* 1259 (1799); Griseb. *Fl. Br. W. Ind.* 12. *Nymphaea foliis orbiculatis &c.* Browne *Hist. Jam.* 243. (Fig. 74.)

## Water Bean.

Lagoons, near Ferry, *Browne*; *McNab!* *Macfadyen!* *Hartweg!* *Dundas* (fide Macfadyen); near Lacovia and Pedro, St. Elizabeth, *R. K. Tomlinson!* *Cornwall, Britton!*

*Rhizome* horizontal, cylindrical, 8 mm. br. *Leaves* to 6 dm. br. when young and flat on water, later raised above water—still larger and concave. *Sepals* about 2.5 cm. l. *Petals* more or less obovate, about 30, outer smaller and calyx-like, inner about 9 cm. l., and 4.5 cm. br., of a primrose colour.

Very near the N. American *N. lutea*, and possibly not specifically distinct.

## FAMILY XXIV. CERATOPHYLLACEÆ.

Aquatic submerged herbs with long leafy branches. Leaves whorled, 2-cleft or dichotomously divided, with linear divisions, often toothed. Flowers solitary, monœcious, sessile in the axils

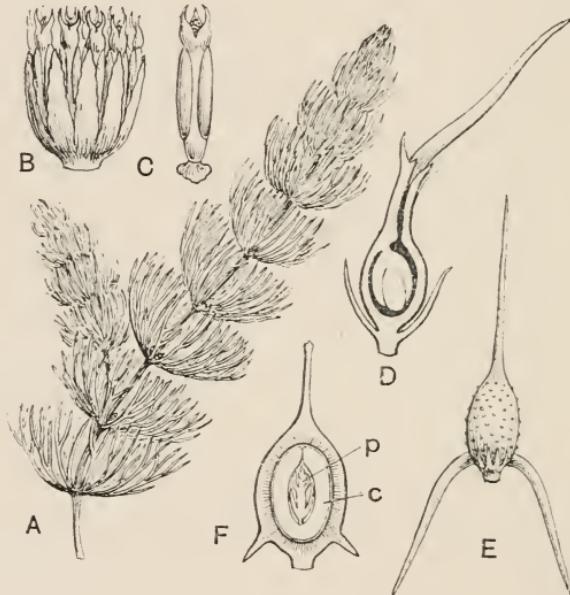


Fig. 75.—*Ceratophyllum demersum* L.

A, Portion of plant  $\times \frac{1}{2}$ .

B, Male flower, magnified.

C, Stamen, magnified.

D, Female flower cut lengthwise showing the ovule, magnified.

E, Fruit, magnified.

F, Fruit cut lengthwise; c, cotyledons;

p, plumule. (B-E after K. Schumann,

F, after Baillon.)

of the whorls. Perianth with 6-12 narrow equal divisions. Male flowers: stamens 10-20; anthers almost sessile, slightly exceeding the perianth; cells 2, extrorse; connective produced into a thick coloured appendage generally 2- or 3-toothed. Female flowers: ovary 1, sessile, ovoid, 1-celled; style long, stigmatose; ovule 1, pendulous. Fruit an indehiscent nut.

Pericarp leathery or hardened, often with 3 or more spines. Seed without endosperm; embryo with oblong, equal cotyledons; plumule well developed with several leaves.

A single genus with one, or at most two or three species, found in fresh water almost all over the world.

### CERATOPHYLLUM L.

*C. demersum* L. *Sp. Pl.* 992 (1753); *Macf. Jam.* ii. 33; *Griseb. Fl. Br. W. Ind.* 12; *K. Schum. in Fl. Bras.* iii. pt. 3, 746, t. 125; *Urb. Symb. Ant.* iv. 236. (Fig. 75.)

Morass Weed.

Shakspear! Lagoon near Ferry, Macfadyen; also McNab! also Purdie! March! Ferry, Fawcett & Harris! swamps, St. Margaret's Bay; pools, Hope River Valley; Harris! *Fl. Jam.* 5958, 9983.

## FAMILY XXV. RANUNCULACEÆ.

Herbs or shrubby climbers. Leaves radical and alternate or opposite. Flowers hermaphrodite or polyamo-dicecious. Sepals generally 5 or 4, hypogynous, free, often petaloid, deciduous, imbricate or valvate. Petals as many as the sepals, or some or all wanting, imbricate. Stamens numerous, hypogynous, free. Carpels (in West Indian species) numerous, with one ovule, ripening into achenes.

Species about 1,200, dispersed over the whole world, but rare and generally confined to the mountains in the tropics.

Herbs .....	1. <i>Ranunculus</i> .
Shrubby, climbing.....	2. <i>Clematis</i> .

### 1. RANUNCULUS L.

Annual or perennial herbs. Leaves lobed or compound. Flowers solitary or cymose, yellow. Sepals 5, imbricate. Petals usually 5, glandular near the base. Ovule ascending. Achenes capitate, shortly beaked.

Species about 250, dispersed all over the world, mostly in temperate and frigid regions of the northern hemisphere, a few in the mountains of the tropics.

Achenes not tubercled.

Stems creeping .....	1. <i>R. repens</i> .
Stems not creeping .....	2. <i>R. recurvatus</i> .
Achenes tubercled .....	3. <i>R. parviflorus</i> .

§ 1. Perennial. Achenes not tubercled.

1. *R. repens* L. *Sp. Pl.* 554 (1753); stem creeping; leaves 3-foliate.—*Macf. Jam.* i. 3. (Fig. 76.)

Catherine's Peak, Macfadyen also Eggers! Cinchona, 5000 ft., Harris! Fl. Jam. 6303.—N. America and mountains of Central and Northern South America, Europe, N. and W. Asia, N. Africa.

Plant 1 ft. high, villose or pubescent. Leaflets 2-4.5 cm. l., cuneate, lobed and toothed, entire in uppermost leaves. Sepals spreading, 6-7 mm. l. Petals 5, obovate-elliptical, 1-1.5 cm. l. Achenes 2.5 mm. l. (excl. beak), with a curved beak; receptacle slightly hairy.

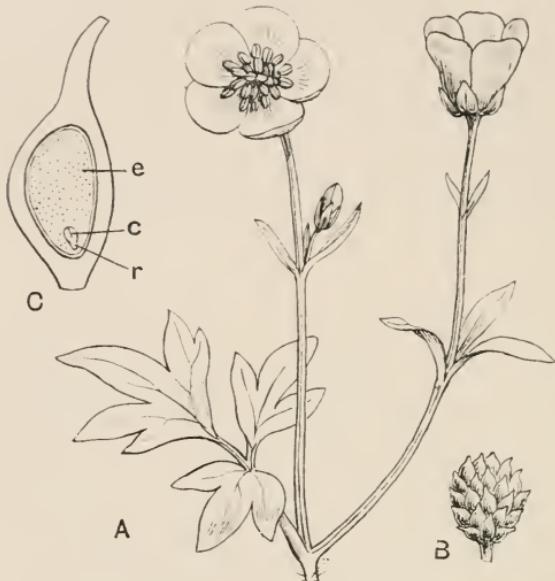


Fig. 76.—*Ranunculus repens* L.

A, Upper portion of stem  $\times \frac{2}{3}$ .  
B, Fruit  $\times \frac{2}{3}$ .

C, Achene cut lengthwise  $\times 10$ ; e, endosperm; c, cotyledons; r, radicle.

2. *R. recurvatus* Poir. *Encyc. vi.* 125 (1804); stems not creeping, leaves 3-cleft.—A. Gr. *Synopt. Fl. N. Amer.* (ed. Robinson) i. pt. 1, 33.

Morse's Gap, Blue Mts.; Morris! also Harris! Fl. Jam. 6304; also G. Nichols!—N. America from Nova Scotia to Florida.

Erect, villose. Leaves mostly radical and round-cordate in outline, 3-cleft to beyond the middle, lobes obovate-rhomboid, incised and dentate, of upper leaves oblong-lanceolate, uppermost leaves (floral) 3-5-sect and sometimes entire, lanceolate, in the Jamaican specimens from Morse's Gap only the lower surface is villose, the upper being quite glabrous. Sepals reflexed, 3 mm. l. Petals obovate-elliptical, 3-4.5 mm. l. Achenes minutely pitted, with a long slender circinate-revolute beak, 2 mm. l. (excl. beak); receptacle hispid.

Var. *tropicus* comb. nov.; leaves 3-foliate or 3-sect.—*R. repens* var. *tropicus* Griseb. *Fl. Br. W. Ind.* 1 (1859). *R. cubensis* Griseb. *Cat. Cub.* 1 (1866); *Urb. Symb. Ant.* vi. 87.

McNab! Blue Mt. Peak, Macfadyen! Portland Gap, 5600 ft., Harris! Fl. Jam. 5891—Cuba, Hispaniola.

§ 2. Annual. Achenes with minutely hooked tubercles.

3. *R. parviflorus* L. *Syst. ed.* 10, 1087 (1759); stem ascending-diffuse; leaves 3-cleft or 3-sect.—*Macf. Jam. i.* 3 *Griseb. Fl. Br. W. Ind.* 2.

“Portland Gap; Catherine’s Peak; Pastures at Salt Hill;” *Macfadyen!* *McNab!* *Cinchona*, 5000 ft., *Harris!* *Fl. Jam.* 8585.—Bermuda, Southern U. States, Madeira, Canary Islands, Europe, N. Africa, W. Asia, Australia and N. Zealand.

Slender, diffuse, villose. Leaves floral often entire, linear, segments coarsely toothed or laciniate-lobed. Sepals at length reflexed, about as long as the petals, villose on the outside. Petals 2–5, oblong, about 3 mm. l. Achenes with a short triangular curving beak, 2 mm. l.; receptacle glabrous.

## 2. CLEMATIS L.

Shrubby climbers. Leaves opposite, usually ternately or pinnately divided; stalk twining. Flowers polygamo-diœcious

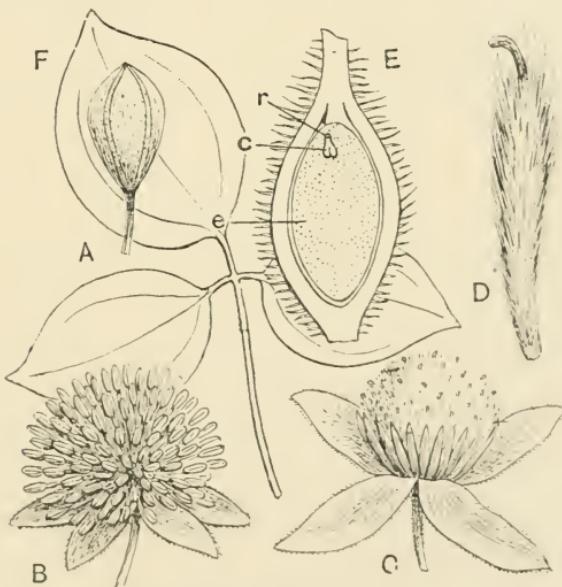


Fig. 77.—*Clematis dioica* L.

A, Bud of male flower  $\times 2$ .

B, Male flower open  $\times 2$ .

C, Female flower  $\times 12$ .

D, Carpel  $\times 5$ .

E, Achene cut lengthwise  $\times 7$ ; e, endosperm; c, cotyledons.

F, Leaf. (A-B, after Eichler.)

in panicles. Sepals 4, petaloid, valvate. Petals none. Ovule pendulous. Achenes capitate, each terminated by a long feathery awn.

Species 170, natives of temperate regions, a few in the tropics.

*C. dioica* L. *Syst. ed.* 10, 1084 (1759) & *Sp. Pl. ed.* 2, 765; *Macf. Jam. i.* 2; *Griseb. Fl. Br. W. Ind.* 1; *Eichl. in Fl. Bras.* xiii. pt. 1, 147, t. 33, f. II. & t. 35 f. III. d.e.; *Urb. Symb. Ant.* iv. 236. *C. caripensis* H. B. & K. *Nov. Gen. & Sp. v.* 36 (1821). *Clematitis prima* &c. *Sloane Cat.* 84 & *Hist. i.* 199, t. 128 f. 1. *Clematis scandens* &c. *Browne Hist. Jam.* 255. Type in *Herb. Mus. Brit.* (Fig. 77.)

Traveller's Joy, Wild Clematis.

Road between St. Jago de la Vega and Guanaboa, woods near Angels; *Sloane Herb.* iii. 122! *Houstoun!* *Wright!* *Broughton!* *Macfadyen!* *Distin!* *McNab!* Manchester, *Purdie!* J.P. 593 *Morris!* Yallahs Valley, 1700 ft.; near Troy, 2000 ft.; Long Mt. west, near Kingston; Cane River Valley, 200 ft.; *Harris!* Fl. Jam. 6843, 8810, 8844, 10,056.—Cuba, Hispaniola, Porto Rico, Guadeloupe, Dominica, Martinique, tropical continental America.

A high climber on shrubs and trees. Leaves (in the Jamaican specimens) ternate; leaflets in the young plant sessile, in older plants stalked, ovate or elliptical, subcordate or obtuse, shortly acuminate, 3-5-nerved, to 9 cm. l. and 7 cm. br. Flowers greenish-white. Sepals 6-8 mm. l. Carpels in female flower surrounded by a ring of staminodes. Achenes about 20, 4 mm. l.

The long slender branches are used as withes. “The negroes bruise the leaves of this plant and apply it as a blister; it is very effectual” (Purdie MS.).

## FAMILY XXVI. MENISPERMACEÆ.

Climbing shrubs or trees. Leaves alternate, without stipules, entire; petiole swollen below the limb. Flowers minute, cymose in panicles or racemes, dicecious. Sepals and petals various in number in dimerous or trimerous whorls, sometimes solitary. Stamens in the male flower 4 or 6 (sometimes indefinite), staminodes in the female flower various, in W. Indian genera 6 or wanting; filaments free or united. Carpels (in W. Indian genera) 3 or 1, ovule solitary. Fruit drupaceous. Seed horsehoe-shaped.

Species about 350, almost all tropical.

Leaves ovate or elliptical .....	1. <i>Hyperbæna</i> .
Leaves roundish, cordate .....	2. <i>Cissampelos</i> .

### 1. HYPERBÆNA Miers.

Trees or climbing shrubs. Leaves ovate, elliptical or oblong, leathery. Male flowers in slender panicles, the branches cymose; female simpler racemose. Bracts and bracteoles minute, hairy. Sepals 6 in 2 series, the inner sepals about

double the size of the outer. Petals 6, shorter than the sepals. Stamens 6, free, in male flowers. Staminodes 6, in female flowers. Carpels 3, with hook-like styles. Fruit a drupe. Endosperm wanting; cotyledons thick, semi-cylindrical, long; radicle very short.

Species 10, natives of W. Indies, Central and S. America.

Male inflorescence longer than the petiole.

Lateral cymules 5–10 mm. l. Drupe 1·2 cm. diam. 1. *H. domingensis*.

Lateral cymules 2–3 mm. l. Drupe 0·7 cm. diam. .... 2. *H. Prioriana*.

Inflorescence not longer than the petiole. Drupe 2·5–3 cm. diam. .... 3. *H. laurifolia*.

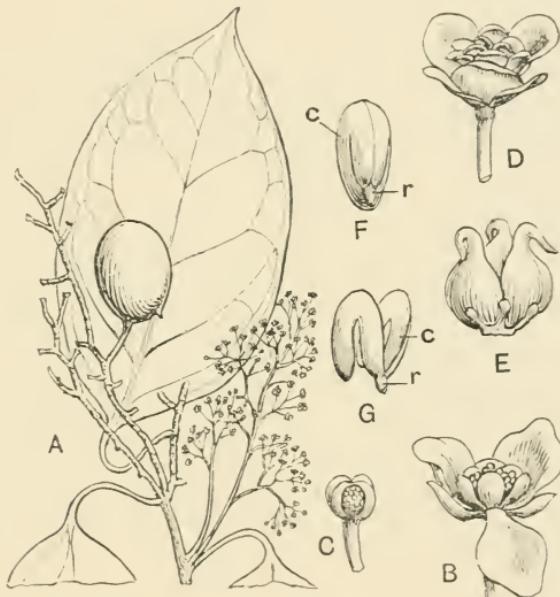


Fig. 78.—*Hyperbæna domingensis* Benth.

A, Portion of stem with flowers and ripe fruit  $\times \frac{2}{3}$ .

B, Male flower with one of the interior sepals bent back  $\times 10$ .

C, Stamen  $\times 30$ .

D, Female flower  $\times 10$ .

E, Pistil from female flower  $\times 60$ .

F, G, Embryo  $\times \frac{3}{2}$ ; c, cotyledons; r, radicle (A, F, G, after Miers; B–E, after Eichler.)

1. *H. domingensis* Benth. in *Journ. Linn. Soc. v. Suppl. 2*, 50 (1861); male inflorescence longer than the petiole, lateral cymules 5–10 mm. l., rhachis glabrescent; drupe 1–1·3 cm. in diam.—*Miers Contrib. Bot. iii.* 298, *t.* 131; *Urb. Symb. Ant. i.* 306 (excl. *H. Prioriana* & *H. valida*) & *iv.* 238. *Diels in Engl. Pflanzenreich iv. pt.* 94, 200. *H. reticulata* Benth. *loc. cit.* (in part). *Cocculus domingensis* DC. *Syst. i.* 528 (1818); *Deless. i. t.* 96; *Griseb. Fl. Br. W. Ind.* 10 (in part). *Pachygone domingensis* Eichl. in *Fl. Bras. xiii. pt. 1*, 197, *t.* 47, *f. II.* (1864). (Fig. 78.)

*Forsyth*; Mt. Diabolo, *Prior*; near Lighthouse, Negril (fruit, in March), *Harris*! Fl. Jam. 10,235.—Cuba, Hispaniola, Porto Rico, St. Eustatius, Guadeloupe, Dominica, Martinique, Guiana, Brazil.

Climbing shrub (Diels) or tree 30 ft. high (Harris). Leaves variable in shape, elliptical to ovate and to oblanceolate, sometimes pubescent on the nerves beneath, 4–18 cm. l., 2·5–11 cm. br., nerves and veins minutely reticulate, generally prominent on both sides (when dry); petiole 1·2–5 cm. l., and often kneed below the blade. Inflorescence 5–25 cm. l., male decomound, female shorter; branches more or less puberulous. Sepals 1·5–1·8 mm. l. Drupe 2 cm. l., scarlet, finally black.

2. *H. Prioriana* Miers *Contrib. Bot. iii.* 301 (1871); male inflorescence longer than the petiole, lateral cymules 2–3 mm. l., rhachis and pedicles ferrugineo-puberulous; drupe small, ·7 cm. in diam.—*Diels tom. cit.* 201.

Moneague, *Prior*! Malvern (fr. in Sept.); *Harris*! Fl. Jam. 9920.

Tree 30 ft. high. Leaves ovate to lanceolate 4·5–7 cm. l., 2–4 cm. br., nerves and veins minutely reticulate, prominent on both sides (when dry); petiole 2–4 cm. l. Inflorescence raceme-like, 3–4·5 cm. l.; rhachis and pedicels ferrugineo-puberulous. Sepals 1·6 mm. l. Drupe obliquely globose-reniform.

3. *H. laurifolia* Urb. *Symb. Ant. i.* 304 (1899); inflorescence not longer than the petiole, rhachis and pedicels ferrugineo-tomentellous; drupe 2·5–3 cm. in diam.—*Urb. Symb. Ant. iv.* 238; *Diels tom. cit.* 203. *H. reticulata* Benth. *loc. cit.* (in part). *H. valida* Miers in *Ann. & Mag. Nat. Hist. ser. 3, xix.* 95 (1867) & *Contrib. Bot. iii.* 302. *Cissampelos laurifolia* Poir. *Encyc. v. 11.*

Holland Bay (fr. in July), *Purdie*.—Porto Rico, St. Thomas, Montserrat.

A small tree 10–16 ft. high. Leaves oblong to lanceolate, 7–22 cm. l., 3–7 cm. br.; nerves and veins minutely reticulate, prominent on both sides (when dry); petiole 1·5–3 cm. l. Inflorescences raceme-like, clustered. Sepals ·75–1·5 mm. l.

## 2. CISSAMPELOS L.

Climbing shrubs. Leaves roundish or roundish-ovate, subcordate, peltate or with the stalk inserted at the margin. Male flowers in paniculate-corymbose cymes; female in simple cymes, generally in clusters at the axils of roundish bracts. Male flowers: sepals 4; petals united into a short cup; stamens connate into a column, peltate at the apex with 4 sessile anthers on the margin (in the W. Indian species). Female flowers: sepal 1; petal 1, opposite the sepal, and shorter than it; carpel 1, style 3-lobed, lobes sometimes 2-lobed. Drupe subglobose, more or less hispid. Embryo curved, within the endosperm; radicle as long as the cotyledons.

Species about 20, natives of tropical America and South Africa, one (*C. pareira*) being found in tropics of both worlds.

**C. pareira** L. *Sp. Pl.* 1031 (1753); *Wright Mem.* 200; *Sw. Obs.* 380, *t.* 10, *j.* 5; *Macf. Jam.* *i.* 16; *Griseb. Fl. Br. W. Ind.* 10; *Miers Contrib. Bot.* *iii.* 139; *Urb. Symb. Aut.* *iv.* 237; *Diels in Engl. Pflanzenreich* *iv.* *pt.* 94, 286. **C. Caapeba** L. *Sp. Pl.* 1032 (1753). **C. microcarpa** DC. *Syst.* *i.* 534 (1818); *Macf. Jam.* *i.* 17; *Miers tom. cit.* 149, *t.* 115. **C. heterophylla** DC. *Syst.* *i.* 534 (1818); *Miers tom. cit.* 145. **C. tomentosa** DC. *Syst.* *i.* 535 (1818); *Miers tom. cit.* 152. **C. consociata** Miers in *Ann. & Mag. Nat. Hist. ser. 3, xvii.* 136 (1866) & *Contrib. Bot.* *iii.* 167. **C. diffusa** Miers in *Ann. & Mag. loc. cit.* & *Contrib.*

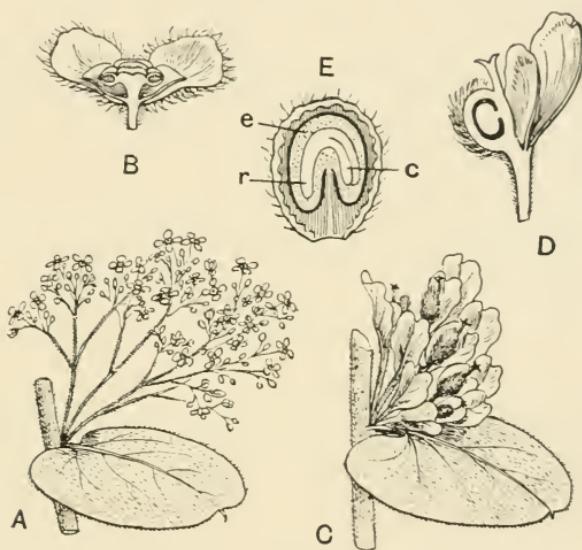


Fig. 79.—*Cissampelos pareira* L.

A, Male inflorescence  $\times \frac{4}{3}$ .

B, Male flower in section  $\times 10$ .

C, Female inflorescence  $\times 6$ .

D, Female flower in section  $\times 12$ .

E, Drupe cut lengthwise  $\times 4$ ; *e*, endosperm; *c*, cotyledons; *r*, radicle.

(After Baillon.)

*Bot. iii.* 168. **C. baccifera** &c. *Sloane Cat.* 85 & *Hist. i.* 200; *Plum. Ic. ined. ii.* 130 & *Descr. Pl. Amer.* 78, *t.* 93. **C. scandens** *foliis* &c. *Browne Hist. Jam.* 357. (Fig. 79.)

Velvet Leaf, Pareira Brava.

Spanish Town, *Sloane Herb.* *iii.* 123\*, 124! *Houstoun!* *Shakspear!* *Browne!* *Wright!* *Broughton!* *Bancroft!* *Macfadyen!* *Distin!* *McNab!* *Torner!* *Manchester!* *Purdie!* *Carpenter Mts., Heward!* *Wilson!* *March!* *Cinchona!* *Castleton, J.P.* 668, 1193, *Morris!* *near Hope, 700 ft., Fawcett!* *Troy, 2000 ft.; Hope; Harris!* *Fl. Jam.* 6968, 8737.

Leaves pubescent on both sides, or only underneath, or glabrate, 2-12 cm. l. and br. Male flower: sepals 1-1.5 mm. l.; corolla 8-1.6 mm. in diam. Female flower: sepal 1-1.5 mm. l.; petal 5-8 mm. l., 1-1.5 mm. br. Drupe 4-5 mm. l.

## FAMILY XXVII. ANNONACEÆ.

Trees or shrubs. Leaves alternate, entire, without stipules. Flowers terminal or opposite the leaves or axillary, solitary or clustered, hermaphrodite. Sepals 3, more or less united at the base, valvate. Petals 6, in two series, valvate or slightly imbricate, the inner series sometimes very small or altogether wanting. Stamens generally numerous (6–18 in *Bocagea*) on the thick receptacle; connective produced beyond the cells of the anther. Carpels numerous or 1–6, free or somewhat cohering; ovules 1 erect, or 2–8 affixed to the ventral suture. Carpels fleshy, free or united into a single large fruit. Seeds with copious ruminate endosperm. Embryo minute near the hilum.

Species about 800, natives mostly of the tropics, a few only being found in subtropical regions.

Carpels united into a single fruit..... 1. *Annona*.  
Carpels free.

Connective truncate. Ovules 2–6 in each carpel..... 2. *Xylopia*.  
Connective long produced. Ovule one in each carpel .... 3. *Oxandra*.

## 1. ANNONA L.

Small trees or shrubs. Flowers generally solitary, stalked, terminal or opposite the leaves. Sepals minute. Petals of the outer series fleshy, more or less partially closed; inner petals somewhat similar or smaller or wanting. Receptacle hemispherical. Carpels numerous, often cohering; ovule solitary, erect. Fruit large, formed of the united carpels.

Species 60, natives of tropics in America, Asia and Africa.

§ 1. Petals 6, the 3 inner conspicuous. Leaves  
glabrous.

Fruit with long, curved spines..... 1. *A. muricata*.

Fruit with minute, straight spines ..... 2. *A. montana*.

Fruit smooth.

Inner petals only slightly shorter than the  
outer .....

3. *A. glabra*.

Inner petals much shorter than the outer... 4. *A. palustris*.

§ 2. Inner petals reduced to minute scales, or  
wanting.

Petals oblong, keeled on the inner side.

Leaves elliptical-oblong or lanceolate.

Fruit tuberculate..... 5. *A. squamosa*.

Fruit smooth ..... 6. *A. reticulata*.

Leaves elliptical, velvety or downy beneath.

Fruit smooth ..... 7. *A. cherimola*.

Fruit tuberculate..... 8. *A. prætermissa*.

Petals ovate. Leaves oblong-elliptical, downy  
beneath with minute hairs ..... 9. *A. jamaicensis*.

## § 1. Petals 6, the 3 inner conspicuous.

1. *A. muricata* *L. Sp. Pl.* 536 (1753); leaves obovate-oblong, shortly acuminate; fruit very large, ovoid, oblong-ovoid or cordate-oblong, green, areolated, the areoles produced into a large, fleshy, curved spine.—*Jacq. Sel. Stirp. Ed. pict.* t. 161; *Tussac Fl. Ant.* ii. t. 24; *Dun. Anon.* 62; *Griseb. Fl. Br. W. Ind.* 4; *Urb. Symb. Ant.* iv. 241. *A. maxima* foliis latis &c. *Sloane Cat.* 203 & *Hist.* ii. 166, t. 225. *A. foliis oblongo-ovatis nitidis &c. Browne Hist. Jam.* 255. *A. foliis ovatis &c. Plum. Pl. Amer. (Burm.)* t. 143, f. 1.

## Sour Sop.

*Sloane* *Herb.* vii. 90, 94! *Thompson!* *Fl. Jam.* 7256. *Hope, Harris!*—W. Indies, cultivated in continental tropical America and West Africa.

A small tree 15–25 ft. high. Leaves 10–15(–25) cm. l., 3·5–4·5(–8) cm. br. Petals yellow, outer cordate-ovate, sometimes shortly acuminate, 3–3·5 cm. l., 2–3 cm. br., 2 mm. thick, inner ovate, obtuse, shortly clawed, appearing in the flower only slightly shorter than the outer. Fruit 15–20 cm. l., 8–10 cm. br.; pulp white. Seeds black or brown, 1·5 cm. l., 1 cm. br.

The fruit is slightly acid, with a flavour of black currants; the pulp squeezed out is a favourite dish, it may be mixed with sugar and water as a drink, or made into an ice. It is considered an antiscorbutic and febrifuge. The unripe fruit is sometimes cooked as a vegetable, and a powder prepared from the dried unripe fruit has been used in the treatment of dysentery.

2. *A. montana* *Macf. Jam. i.* 7 (1837); leaves oblong-elliptical, very shortly and abruptly acuminate, shining on upper surface; fruit small, globose, covered with small, fleshy, straight spinules.—*Griseb. loc. cit.*; *Urb. loc. cit.*

## Mountain or Wild Sour Sop.

Orchard, Port Royal Mts., *Macfadyen*; Claverty Cottage, Blue Mts., J. P. 1457; *Hart!* Green Valley, *Johnson!* Yallahs Valley, 1700 ft.; Troy, 1600 ft.; Hope River Valley, *Harris!* *Fl. Jam.* 6862, 9446, 9979.—Cuba, Hispaniola, Porto Rico, Antigua, Guadeloupe, Guiana.

A low tree 15 ft. high. Leaves 7–13·5 cm. l., 3–5·5 cm. br. Petals olive-green, outer roundish-ovate, subacuminate, 3–3·5 cm. l., 2–2·5 cm. br., inner roundish-elliptical, of nearly the same size as the outer, but thinner; claw 4–6 mm. l. Fruit about 5 cm. in diam., dry, not edible. Seeds brown, nearly 2 cm. l., 1 cm. br.

3. *A. glabra* *L. Sp. Pl.* 537 (1753); leaves oblong or oblong-elliptical, acute; inner petals only slightly shorter than the outer; fruit broadly ovate, apex rounded, faintly areolated, smooth.—*Sarg. Silv. i.* 29, *tt.* 17, 18; *Dun. Anon.* 74. *A. laurifolia* *Dun. Anon.* 65 (1817); *Griseb. loc. cit.* *A. maxima* foliis latis &c. *Catesby Nat. Hist. Carol.* 64, *t.* 64.

## Pond Apple.

St. Ann, *McNab.*—Florida, Bahamas, Hispaniola, St. Thomas, St. Cruz.

A small tree 30–40 ft. high. Leaves 7–14 cm. l., 4–6 cm. br. Petals pale yellow or dirty white, outer roundish, shortly acuminate, 2·5–3 cm. l., with a red spot inside near base; inner narrower. Fruit broadly ovate,

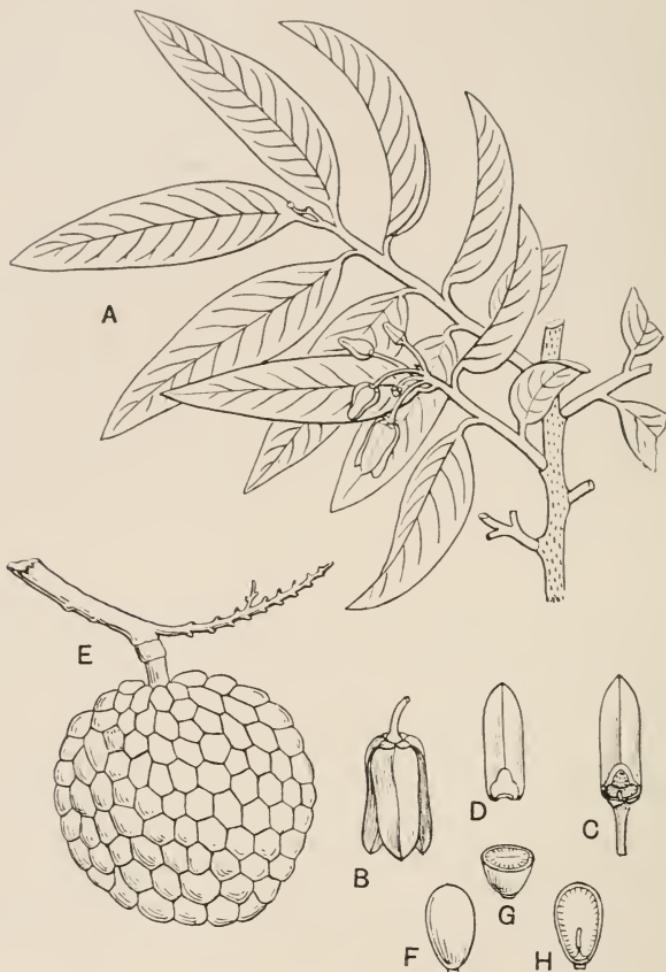


Fig. 80.—*Annona squamosa* L.

A, Portion of branch with leaves and flowers $\times \frac{1}{3}$ .	E, Fruit $\times \frac{1}{3}$ .
B, Flower $\times \frac{2}{3}$ .	F, Seed $\times \frac{2}{3}$ .
C, Receptacle and petal $\times \frac{2}{3}$ .	G, Do. cut across $\times \frac{2}{3}$ .
D, Petal $\times \frac{2}{3}$ .	H, Do. cut lengthwise $\times \frac{2}{3}$ .

(From a drawing by Miss H. Wood.)

truncate or depressed at base, rounded at apex, 7·5–12 cm. l., 5–8 cm. br., yellow when quite ripe; flesh "light green, slightly aromatic, insipid, edible but of no comestible value" (Sargent). Seed about 1·5 cm. l. and 1 cm. br.

4. *A. palustris* L. *Sp. Pl. ed. 2*, 757 (1762); leaves oblong-elliptical, shortly acuminate, veins prominent beneath; inner petals much shorter than the outer; fruit ovoid-roundish, apex rounded, faintly areolated, smooth.—*Dun. Anon.* 65; *Hook. Bot. Mag. t. 4226*; *Macf. Jam. i.* 18; *Griseb. op. cit.* 5; *Urb. loc. cit.* *A. aquatica* &c. *Sloane Cat.* 205 & *Hist. ii.* 169, *t.* 228, *f.* 1. *A. uliginosa* &c. *Browne Hist. Jam.* 256. *A. fructu viridi* &c. *Catesby tom. cit.* 67, *t.* 67.

Alligator Apple, Cork Wood.

Bridge over Black River in St. Dorothy, *Sloane* (seeds only)! *Wright!* *Shakspear!* *Wilson!* Ferry River, *Harris!*—Bahamas, Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, St. Jan., Antigua, Guadeloupe, Saintes, Martinique, St. Vincent, S. America, W. Africa.

A small tree 6-15 ft. high. *Leaves* 7-15 cm. l., 3·5-5·5 cm. br. *Petals* outer roundish-ovate, very shortly acuminate, greenish-yellow, 2 cm. l., about 1·5 cm. br.; inner externally whitish, internally of a dark blood colour, about 1·5 cm. l. and 1 cm. br. *Fruit* about 7 cm. l., 6 cm. br. *Seeds* brown, about 1·5 cm. l., 1 cm. br.

The fruit has a pleasant smell, but the taste is disagreeable, and it is supposed to be poisonous. Alligators are said to be very fond of the fruit, whence one of its common names. The wood is light and soft, and is called Cork Wood from the uses to which it is put; it is used as cork to stop jugs, bottles and casks, as floats for fishing nets, and is made into rafts for fishing.

§ 2. Petals 3, the inner series reduced to minute scales, or wanting.

5. *A. squamosa* L. *Sp. Pl.* 537 (1753); leaves oblong, oblong-lanceolate or narrowly elliptical; flowers generally several in a cluster; petals oblong, keeled on the inner side, inner series wanting; fruit tuberculate.—*Jacq. Sel. Stirp. Ed. pict. t. 162*; *Tussac Fl. Ant. iii. t. 4*; *Dun. Anon.* 69; *Bot. Mag. t. 3095*; *Macf. Jam. i.* 9; *Griseb. loc. cit.*; *Urb. tom cit.* 242. *A. cinerea*, *Dun. Anon.* 71, *t.* 8 (1817). *A. foliis odoratis* &c. *Sloane Cat.* 205 & *Hist. ii.* 168, *t.* 227. *A. foliis oblongo-ovatis undulatis* &c. *Browne loc. cit.* Type in *Herb. Mus. Brit.* (Fig. 80.)

Sweet Sop.

*Sloane Herb.* vii. 96, 97, 98! *Wright!* *Shakspear!* *J.P.* 592, *Morris Hope, Fawcett!* near Kingston, *McNab!* (a pubescent form, *A. cinerea* *Dun.*)—West Indies, cultivated in the tropics.

A small tree or shrub, about 15-20 ft. high. *Leaves* 7-14(-17) cm. l., 3-4(-5·5) cm. br. (those on the flowering branches much smaller), slightly pubescent on nerves or glabrate. *Petals* 1·6-2(-2·5) cm. l., hollowed out and coloured purple at the base. *Fruit* 8-9 cm. br., globular; pulp white with a tinge of yellow. *Seeds* dark brownish.

The fruit is edible, sweet, and when grown in the hills, of excellent flavour, as good as the Cherimoya.

6. *A. reticulata* L. *Sp. Pl.* 537 (1753); leaves oblong-lanceolate or oblong-elliptical; petals oblong, keeled on the inner

side; fruit smooth, reticulate-areolate.—*Tussac Fl. Ant.* i. t. 29; *Dun. Anon.* 72; *Bot. Mag.* t. 2911, 2912; *Macf. Jam.* i. 10; *Griseb. loc. cit.*; *Urb. loc. cit.* *A. maxima* foliis oblongis &c. *Sloane Cat.* 204 & *Hist.* ii. 167, t. 226. *A. foliis lanceolatis* &c. *Plum. Pl. Amer. (Burm.)* t. 143 f. 2. *A. foliis oblongis* &c. *Browne loc. cit.* Type in *Herb. Mus. Brit.*

Custard Apple, Coeur de Bœuf.

*Sloane* *Herb.* vii. 94\*! *Wright!* *Swartz!* Blue Mts., *Macfadyen*.—West Indies, cultivated in the tropics.

A small tree 15-30 ft. high. Leaves 10-20 cm. l., 3-5(2) cm. br. Petals 2-3 cm. l., hollowed out and coloured purple at the base. Fruit 9-10 cm. in diam.; subglobose, depressed at the stalk end. Seeds brown.

The fruit is edible, and rather luscious. It is said to be a remedy for diarrhoea and dysentery.

7. *A. cherimola* *Mill. Dict. ed. 8, no. 5 (1768);* leaves elliptical, velvety beneath; petals oblong, keeled on the inner side, inner minute.—*Dun. Anon.* 72; *Macf. Jam.* i. 9; *Griseb. loc. cit.* *A. tripetala* *Ait. Hort. Kew.* ii. 252 (1789); *Bot. Mag.* t. 2011. *A. foliis ovatis* &c. *Trew Pl. Select.* 16, t. 49. Type in *Herb. Mus. Brit.*

Cherimoya.

*Cinchona, Fawcett!* *Harris!* *Fl. Jam.* 7675, 9373.—Andes.

A small tree usually about 15 ft. high. Leaves 7-14 cm. l., 4-9 cm. br. Petals, outer 2-2.5 cm. l. Fruit usually as large as the Sour Sop, especially under cultivation, of a light green colour; pulp white; seeds black.

“The fruit is one of the most delicious of the kind, there being a slight agreeable acidity mingled with a luscious sweetness” (*Macfadyen*). The fruit is brought from Madeira to Great Britain, and sold under the name of “custard apple.”

8. *A. prætermissa* *Fawc. & Rendle in Journ. Bot. lii. 74 (1914);* leaves elliptical or ovate-elliptical, downy beneath with minute adpressed hairs; buds acuminate-conical; petals oblong; fruit areolate, tuberculate. Type in *Herb. Jam.*

Craig Hill, near Petersfield and Gordon Town, 2400 ft., June (1902), *Fawcett!* also, June (1913), *Harris!* *Fl. Jam.* 11,648.

A small tree, about 15-30 ft. high. Leaves 12-18 cm. l., 4.5-8.5 cm. br.; petiole 13-16 mm. l. Peduncle 1-2-flowered, very short to 1.5 cm. l.; pedicels very short to 1.5 cm. l. Sepals 2.5-3 mm. l. Petals 3, 2-2.5 cm. l., .5 cm. br. Stamens 2 mm. l.; anther about 1.5 mm. l. Fruit globose, about 6 cm. in diam.; tubercles usually hooked at the apex. Seeds 17 mm. l., 10 mm. br.

9. *A. jamaicensis* *Sprague in Bull. Herb. Boiss. sér. 2, v. 701 (1905);* leaves oblong-elliptical, downy beneath with minute adpressed hairs; buds ovate; petals 3, ovate; fruit tuberculate.—*Safford in Contrib. U.S. Nat. Herb.* xvi. 274. *A. sericea* *Griseb. loc. cit.* (excl. distribution) non *Dunal.* Type in *Herb. Kew.*

## Wild Cherimoya.

Near Bath, Purdie! Wilson! March! Prior! Sheldon Road, 2500 ft.; Berwick, Blue Mts.; Peckham, Clarendon, 2500 ft.; Harris! Fl. Jam. 6861, 11,058; Hampton, St. Cruz Mts., Britton, 1196.

A small tree, 20-25 ft. high. Leaves 10-20 cm. l., 5-9 cm. br. Petals 3, 11-12 mm. l., 8 mm. br. Fruit globose, 4.5-5.5 cm. in diam.; tubercles hooked at the apex. Seeds 14-15 mm. l., 6-7 mm. br.

## 2. XYLOPIA L.

Trees or shrubs. Leaves leathery. Flowers axillary, sessile or shortly stalked. Petals, the outer long and narrow, thick, connivent or scarcely open, the inner included, narrower, 3-angled above, slightly shorter than the outer. Stamens on the outer side of the cup-shaped receptacle which encloses the carpels; connective dilated, truncate beyond the anther. Carpels 1-5, distinct, with the long styles exserted; ovules 2-6, ventral. Berries somewhat oblong or ellipsoidal. Seed with scale-like aril at base, sometimes hairy. Bitter Wood. African Pepper.

Species about 100, natives of tropics in America, including the West Indies, West Africa, Madagascar, Ceylon, Malaya, New Caledonia.

Leaves glabrous, elliptical, 4-7 cm. l. .... 1. *X. glabra*.  
 Leaves strigose on midrib beneath, lanceolate, 7-8 cm. l. 2. *X. muricata*.  
 Leaves glabrous above, sericeous beneath, lanceolate,  
 9-13 cm. l. .... 3. *X. grandiflora*.

1. *X. glabra* L. *Sp. Pl. ed. 2*, 1367 (1763) non *Syst. ed. 10*, 1250 (1759); leaves elliptical, apex acute, obtuse or shortly acuminate, glabrous.—*Dun. Anon.* 121, *t. 19*; *Macf. Jam. i.* 13; *Griseb. Fl. Br. W. Ind.* 6. *Xylopicron* foliis &c. *Browne Hist. Jam.* 251.

## White Lancewood.

Hills near Bull Bay, Browne; Masson! Wright! March! Prior! near Troy, 2000 ft., "White Lancewood"; Peckham, Clarendon, 2500-2800 ft.; Harris! Fl. Jam. 9438, 10,869, 10,943, 10,945, 11,067; Union Hill, Moneague, Britton & Hollick, 2792!

A tree, 15-40(-60) ft. high. Leaves 4-7 cm. l., 2-3 cm. br. Flowers 2-4 in a cluster, shortly stalked. Calyx about 2 mm. l. Petals white, outer about 8 mm. l. Berries nearly 2.5 cm. l. (incl. short stalk), about .5 cm. br., narrowly oblong, with about three seeds in each. Seeds about 8 mm. l.

According to Browne, the wood, bark and berries have a warm bitter agreeable taste. The wild pigeons are said to feed much upon the berries, and owe to them the delicate bitterish flavour, so peculiar to them. The wood is easily worked, and is considered a useful timber where it is not exposed to the weather. The fruits of many species of the genus are used as aromatics and condiments.

Linnaeus founded his *X. glabra* *Syst. ed. 10* on *Pluk. Phyt. t. 238* (errore 284), *f. 4*, the original of which in *Herb. Sloane* *xcviii.* 177 is however a specimen of *Anona squamosa* L. *X. glabra* L. must therefore

be quoted from Sp. Pl. ed. 2, where Linnaeus cites also Brown. Jam. 251; Browne's description agrees with the plant now understood by this name. It is interesting to note that Browne doubts the identity of Plukenet's plant with his own.

2. *X. muricata* L. *Syst. ed. 10*, 1250 (1759); leaves lanceolate, long-acuminate, strigose on midrib beneath.—*Dun. Anon.* 120; *Macf. Jam.* 13. *X. jamaicensis* Griseb. *loc. cit.* (1859). *Xylopicrum fruticosum* &c. *Browne Hist. Jam.* 250, *t. 5, f. 2*. Type in *Herb. Linn.*

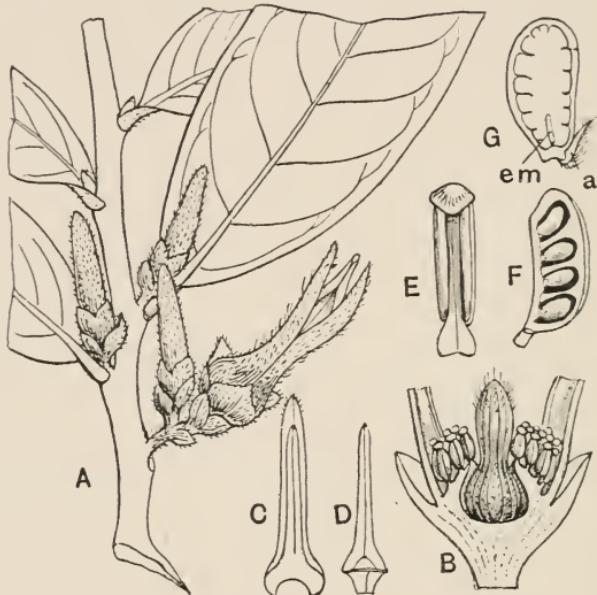


Fig. 81.—*Xylopia grandiflora* A. St. Hil.

A, Twig with flowers  $\times \frac{2}{3}$ .

B, Section of flower with petals removed  $\times 2$ .

C, Outer petal  $\times \frac{2}{3}$ .

D, Inner petal  $\times \frac{2}{3}$ .

E, Stamen  $\times 8$ .

F, Berry cut lengthwise, nat. size.

G, Seed cut lengthwise, showing the aril (a) and the embryo (em)  $\times 24$ .

(After A. Richard.)

Mts. in Sixteen Mile Walk, *Browne*; *Prior*! *March*! *Ramble*, Claremont, *Fawcett* & *Harris*! *Tyre*, near *Troy*, 2000 ft. ("Lancewood"); *Peckham*, *Clarendon*, 2300 ft.; *Harris*! *Fl. Jam.* 7033, 9477, 11,064.

A tree 20-30 ft. high. Leaves 7-8 cm. l., 1.3-2.5 cm. br. Flowers generally 2 in a cluster, shortly stalked. Calyx about 2.5 mm. l. Petals, outer 1.4-1.5 cm. l. Berries 2.5-3 cm. l., 1.6-1.8 cm. br., ellipsoidal, stalked, with about 3 seeds in each. Seeds about 8 mm. l.

3. *X. grandiflora* A. St. Hil. *Fl. Bras. Mer. i. 40, t. 8* (1825); leaves lanceolate, acuminate, glabrous on upper surface, sericeous beneath, midrib puberulous on both sides.—*Griseb. loc. cit.*

*X. cubensis* A. Rich. in *Sagra Cub.* x. 16, t. 36 (1845). (Fig. 81.)

Without collector's name or locality, Grisebach *loc. cit.*—Cuba, Is. of Pines, Trinidad, Panama and tropical South America.

A tree. Leaves 9–13 cm. l., 2·5–4 cm. br. Flowers 2 or 3 in a cluster, shortly stalked. Calyx 4–5 mm. l. Petals, outer 3·3 cm. l. Berries 1·2 to nearly 2 cm. l., 6–1 cm. br., somewhat oblong-ellipsoidal; seeds 2–4.

The berries are used in the pharmacies of Brazil for medicinal purposes; they are said to be energetic tonics for the stomach and intestines, on which they have a binding, carminative, and stimulant action. They are gathered, like pimento, before they are ripe, and are of equal virtue as a condiment for seasoning meat, fish, &c.

### 3. OXANDRA A. Rich.

Trees or shrubs. Flowers solitary or clustered, axillary or lateral. Bracts numerous, like the sepals but smaller, imbricated in 2 rows, inserted either from the base to the apex of the

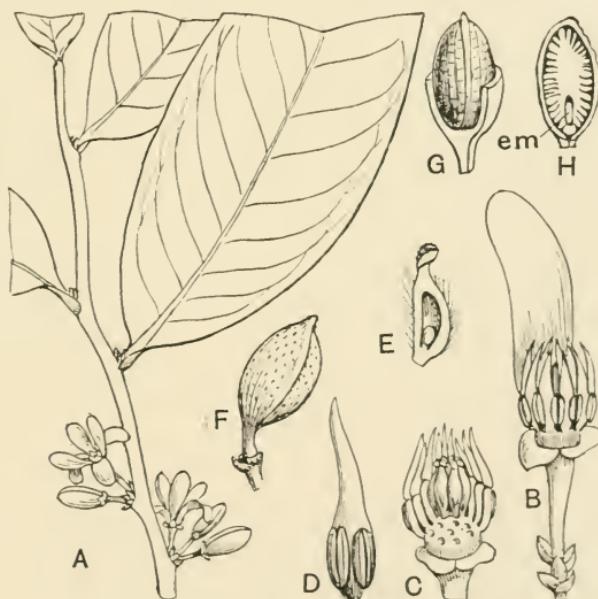


Fig. 82.—*Oxandra laurifolia* A. Rich.

A, Twig with flowers  $\times \frac{3}{4}$ .

B, Flower with 5 petals removed  $\times 4$ .

C, Receptacle with some of the stamens and carpels  $\times 4$ .

D, Stamen  $\times 8$ .

E, Carpel cut lengthwise  $\times 8$ .

F, Berry  $\times \frac{3}{4}$ .

G, Do. with pericarp cut away to show seed  $\times \frac{3}{4}$ .

H, Seed cut lengthwise, showing the embryo (em)  $\times \frac{3}{4}$ .

(After A. Richard.)

peduncle or only in an involucre at the base. Sepals imbricate. Petals 6 in two series, imbricate, inner slightly shorter than the outer, erect-spreading. Stamens numerous; connective produced

above the extorse anthers into a long, tapering appendage. Receptacle convex. Carpels numerous, distinct; ovule 1, erect. Berries ellipsoidal, stalked. *Lancewood*.

Species 8, natives of tropical America (incl. West Indies).

Leaves oblong-elliptical, 8-16 cm. l..... 1. *O. laurifolia*.  
Leaves elliptical, 4-10 cm. l..... 2. *O. lanceolata*.

1. *O. laurifolia* *A. Rich.* in *Sagra Cub.* 20, *t. 8* (1845); leaves oblong-elliptical, acuminate, villose underneath when young; flowers axillary and lateral, clustered or subsolitary; outer petals oblong, obtuse; berries stalked.—*Griseb. Fl. Br. W. Ind.* 7; *Urb. Symb. Ant.* *iv.* 239. *Uvaria laurifolia* *Sw. Fl. Ind. Occ.* 1001 (1800). *Guatteria laurifolia* *Dun. Anon.* 132, *t. 32* (1817); *Macf. Jam. i.* 14. *Bocagea laurifolia* *Benth. & Hook. f. Gen. Pl. i.* 29 (1862); *Fawc. Fl. Pl. Jam. I.* Arbor foliis ovatis glabris &c. *Browne Hist. Jam.* 370. (Fig. 82.)

Portland, *Browne*; *Priestmans River, Deans!*—Cuba, Hispaniola, Porto Rico, St. Cruz, Guadeloupe.

*Tree*, 50 ft. and over, 12-18 in. in diam. and more. *Leaves* 8-16 cm. l., 3-5 cm. br.; petiole stout, 3 mm. l. *Calyx* 1.5 mm. l. *Petals* white, 7 mm. l. *Berries* 11-16 mm. l., 8-10 mm. br.

A good timber tree, especially where strength or elasticity is required. This species seems to be confined to the north-eastern portion of the island. See remarks on the next species, which are also applicable here.

2. *O. lanceolata* *Baill.* in *Adansonia viii.* 168 (1868); leaves elliptical, acuminate, tapering to base; flowers axillary, subsolitary; outer petals obovate-roundish; berries subsessile.—*Urb. loc. cit.* *O. virgata* *A. Rich. loc. cit.*; *Griseb. loc. cit.* *Uvaria lanceolata* *Sw. Prodr.* 87 (1788). *U. virgata* *Sw. Fl. Ind. Occ.* 999. *Guatteria virgata* *Dun. Anon.* 131, *t. 31* (1817); *Macf. Jam. i.* 14. *Bocagea virgata* *Benth. & Hook. f. loc. cit.*; *Fawc. loc. cit.*

#### Black lancewood.

*March!* Hope, 700 ft.; Grandvale, Westmoreland, 500 ft.; Troy, 1400 ft.; *Harris!* Fl. Jam. 6720, 6863, 7099, 8613, 9431.—Cuba, Hispaniola, Porto Rico.

A straight-growing tree, to 30 ft. high, and 8-12 ins. in diam. *Leaves* 4-10 cm. l., 2-4 cm. br.; petiole 1-2 mm. l. *Calyx* about 2.2 mm. l. *Petals* 4-5 mm. l. *Berries* 11-12 mm. l., 7-9 mm. br.

The wood is tough, strong and elastic, with very fine, dense grain and lustrous surface; it is extremely hard, equaling boxwood. It is imported into England under the name of "lancewood spars" for carriage building. It is also used for lances, fishing-rods, ramrods and general turnery. Weight 52-63 lbs. per cubic foot.

## FAMILY XXVIII. LAURACEÆ.

Trees or shrubs or parasitic twining herbs (*Cassytha*). Leaves alternate, pinnately-nerved (subtriplinerved in *Phæbe montana*) ; stipules wanting. Flowers small, in cymes at the apex of peduncles, forming axillary panicles, or (in *Cassytha*) in spikes or racemes, hermaphrodite or (in *Ocotea*) diœcious, regular. Perianth, tube often very short, generally developing into a cupule at the base of the fruit ; segments of the limb generally 6, in a double series, the outer series being sometimes smaller than the alternating inner series. Stamens opposite the perianth-segments, in a double ring, an outer ring of 6 perfect stamens, and an inner ring of which 3 are perfect, alternating with 3 staminodes which are often very small or altogether wanting ; in *Misanteca* the outer ring and the staminodes are wanting. Filaments free or (in *Misanteca*) united into a staminal tube, sometimes very short or wanting ; those of the perfect stamens of the inner ring with a gland at each side of the base. Anthers with 2 or 4 cells, opening by valves, those of the outer ring inwards and those of the inner ring outwards or laterally. Ovary free, 1-celled with 1 ovule pendulous from near the apex. Fruit a 1-seeded berry, with the perianth enlarged and persistent, or only the tube persistent, forming a cupule at the base of the berry, or with the whole perianth deciduous (in *Hufelandia*). Seed without endosperm. Embryo straight ; cotyledons thick and fleshy ; plumule and hypocotyl conspicuous.

Species, about 1000, for the most part natives of the warmer regions of America, Asia, Australia and the islands in the Pacific ; a few are found beyond the tropics in N. and S. America, the Mediterranean Region, the Canary Islands, S. Africa and New Zealand, and a few also in tropical Africa.

## KEY FOR FLOWERS.

Leafy trees or shrubs.

Anthers 2-celled.

Stamens 9 .....	1. <i>Hufelandia</i> .
Stamens 3, united.....	2. <i>Misanteca</i> .

Anthers of the outer ring 4-celled.

Staminodes large, sagittate.

Lower cells of anthers touching the upper at the side. Leaves pinnately-nerved.....	3. <i>Persea</i> .
--	--------------------

Lower cells of anthers touching the upper at their base. Leaves subtriplinerved in Jamaican species .....	4. <i>Phæbe</i> .
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Staminodes none or stalk-like, sometimes clavate. Anther-cells, one directly above the other, in pairs.....	5. <i>Ocotea</i> .
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Anther-cells of the outer ring more or less in a bow-shaped curve.....	6. <i>Nectandra</i> .
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Twining, parasitic herbs, the leaves represented by small scales.....

7. <i>Cassytha</i> .
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## KEY FOR FRUITS.

Leafy trees or shrubs.

Fruit without a cupule..... 1. *Hufelandia*.

Fruit with a cupule.

Perianth-segments persistent in fruit.

Segments enlarged only at base, not lengthened.

Fruit globose, or pear-shaped (edible).

Leaves pinnately-nerved..... 3. *Persea*.Fruit ellipsoidal. Leaves subtriply-nerved in Jamaican species..... 4. *Phœbe*.

Segments enlarged generally.

Cupule flat ..... *Ocotea floribunda*.Cupule cup-shaped ..... *Ocotea staminea*.

Perianth-segments deciduous in fruit.

Cupule bell-shaped, hemispherical, 2-margined .....

2. *Misanteca*.Cupule saucer-shaped or flat, 1-margined... 5. *Ocotea*, or6. *Nectandra*.

Twining parasitic herbs. Fruit enclosed by the enlarged persistent perianth .....

7. *Cassytha*.

## 1. HUFELANDIA Nees.

Perianth, tube very short ; segments 6, subequal ; the whole perianth deciduous in the fruit. Stamens 9 ; anthers 2-celled ; glands large, roundish ; staminodes large, cordate-sagittate. Berry ellipsoidal, without a cupule ; pedicel somewhat thickened.

Species 7 or 8, natives of tropical America, one species occurring in the West Indies.

*H. pendula* Nees *Plant. Laur.* 22 (1833) & *Syst.* 188 ; *Meisn. in DC. Prodr.* xv. pt. 1, 65 ; *Griseb. Fl. Br. W. Ind.* 280 ; *Mez in Jahrb. Bot. Gart. Berl.* v. 20, t. II. f. 2, III. f. 8, 25, 25a ; *Urb. Symb. Ant.* iv. 243. H. Thomæa Nees *Plant. Laur.* 23 & t. (1833) & *Syst.* 189. *Laurus pendula* Sw. *Prodr.* 65 (1788) & *Fl. Ind. Occ.* 719. *Beilschmiedia pendula* Benth. & Hook. f. *Gen. Pl.* iii. 152 (1880) ; *Fawc. Fl. Pl. Jam.* 33. B. Thomæa Benth. & Hook. f. *loc. cit.* (1880) ; *Fawc. loc. cit.* *Laurus foliis obverse &c.* *Browne Hist. Jam.* 214. (Fig. 83.)

Slog-wood or Slug-wood; Laurier madame (Dominica). In fl. March-Sept.; in fr. Sept., Nov., Feb.; *Swartz!* *Caley!* *Macfadyen!* St. Mary, *Purdie!* March! Browns Town, *Prior!* Silver Hill; Spanish River; Doll Wood; Whitfield Hall, 4350 ft.; Troy, 1600 ft.; *Harris!* near Mandeville, 2100 ft., *Harris & Britton!* *Fl. Jam.* 5296, 5326, 5575, 9447, 10,594.—Cuba, Hispaniola, Porto Rico, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia.

*Tree* 20-45(-60) ft. high. *Leaves* elliptical, base wedge-shaped, apex generally shortly acuminate, areolate on both sides, nerves prominent beneath, slightly puberulous beneath when young, at length glabrous on both sides, 5-16 cm. l, 2-5.5 cm. br. *Panicles* lax, few-flowered. *Flowers*

greenish-yellow, 2-2.5 mm. l. Perianth-segments roundish or roundish-elliptical. Berry black, elongated-ellipsoidal, 2.7-3.3 cm. l., 1.3 1.5 cm. br.

The timber is useful for general purposes, the wood being hard, and standing exposure.

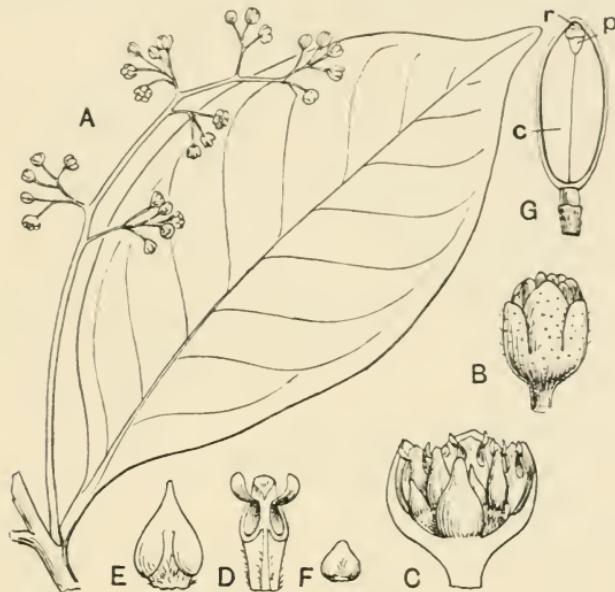


Fig. 83.—*Hufelandia pendula* Nees.

A, Inflorescence and leaf  $\times \frac{2}{3}$ .

E, Staminate  $\times 20$ .

B, Flower  $\times 6$ .

F, Gland  $\times 12$ .

C, Do, cut lengthwise and flattened somewhat  $\times 6$ .

G, Fruit cut lengthwise  $\times \frac{2}{3}$ ; c, cotyledons; p, plumule; r, radicle.

D, Exterior anther  $\times 12$ .

## 2. MISANTECA Cham. & Schl.

Perianth, tube evident, fleshy; segments 6, small, scale-like, deciduous in fruit. Stamens 3, united into a tube, glandular below; the 2-celled anthers opening outwards. Berry oblong-ellipsoidal or ovoid, surrounded by the enlarged cupule-like perianth-tube usually with a double margin.

Species 4, natives of tropical America.

*M. triandra* Mez in *Jahrb. Bot. Gart. Berl.* v. 103 (1889); *Urb. Symb. Ant.* iv. 244. *Laurus triandra* Sw. *Prod. 65* (1788) & *Fl. Ind. Occ.* 706. *Aerodidclidium jamaicense* Nees *Syst. 270* (1836); *Meisn. in DC. Prod. xv. pt. 1, 85*; *Griseb. Fl. Br. W. Ind.* 280. *Sympysodaphne cubensis* Rich. in *Sagra Cub.* xi. 190, t. 67 (1850). (Fig. 84.)

Sweet-wood.

In fl. Oct.; in fr. March-July; *Wright!* *Swartz!* *Macfadyen!* *Harmony Hall*; *St. Mary*; *McNab!* *Prior*; *Wilson!* *March!* *Green Valley*,

J.P. 1277, Morris! Robertsfield, J.P. 1875, Hart! Plato; Green Valley, 2000-2200 ft.; Tweedside; Chester Vale, 3000 ft.; Harris! Fl. Jam. 5362, 5488, 5630, 5728, 6816, 11,003.—Cuba, Hispaniola, Porto Rico.

Tree 30-40 ft. high. Leaves narrowly elliptical, acuminate, nerves and veins obscurely prominulous above, distinctly beneath, glabrous, 6-12 cm. l., 2.5-4.5 cm. br. Inflorescence paniculate, becoming corymbose in fruit. Flowers subumbellate at the apex of the peduncles, about 2.5 mm. l.

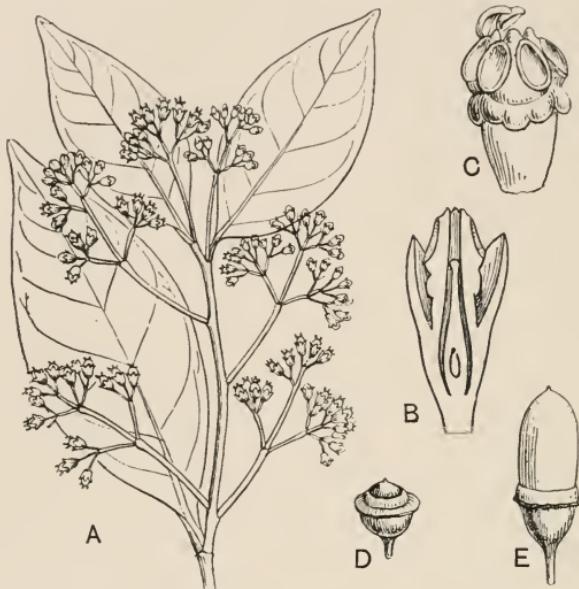


Fig. 84.—*Misanteca triandra* Mez.

A, Portion of flowering branch  $\times \frac{2}{3}$ .

D, Young fruit  $\times \frac{3}{2}$ .

B, Flower cut lengthwise  $\times 10$ .

E, Mature fruit  $\times \frac{3}{2}$ .

C, Staminal tube  $\times 10$ .

Perianth, tube funnel-shaped, about  $1\frac{1}{2}$  times as long as the lobes. Anthers evident when flower opens, about 1 mm. l. Glands dilated-cordate, two often united, arising at about half the height of the staminal tube. Staminodes none. Pistil about 2 mm. l. Berry 2 cm. l., 1.2 cm. br.; when young almost enclosed by the cupule; cupule bell-shaped, hemispherical, bright red, covering about one-third of the berry; pedicel somewhat thickened.

### 3. PERSEA Gaertn. f.

Leaves somewhat leathery, generally puberulous beneath. Inflorescence, joints often broadening somewhat upwards. Perianth, tube none; segments, outer  $\frac{1}{2}-\frac{1}{3}$  as long as the inner (subequal in *P. americana*), persistent in fruit. Stamens 9; anthers 4-celled (but those of the inner stamens 2-celled in *P. Urbaniana*); staminodes large, cordate-sagittate, stalked. Berry globose or elliptical, or pear-shaped in *P. americana*;

perianth-segments spreading, not enlarged in fruit; the pedicel not thickened, or only slightly, in fruit.

Species 63, widely dispersed through N. and S. America, 6 species occurring in the West Indies, 2 or 3 in temperate

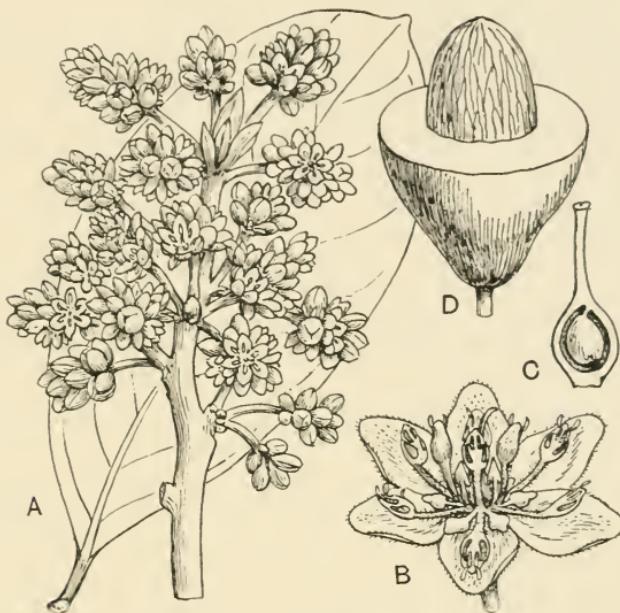


Fig. 85.—*Persea americana* Mill.

A, Leaf and inflorescence  $\times \frac{1}{2}$ .  
B, Flower  $\times 3$ .  
C, Pistil cut lengthwise  $\times 3$ .

D, One-third of the lower portion of the fruit with the stone  $\times \frac{1}{2}$ .

N. America, 2 in Chile, 1 in the Canary Isles, 3 in China and 1 in Australia.

Inflorescence much shorter than the leaves.

[Flowers 6-7 mm. l. Perianth-segments subequal..... *P. americana*.]

Flowers 3-4 mm. l. Outer perianth-segments one-third as long as inner..... 3. *P. Urbaniana*.

Inflorescence long-stalked, longer than or subequal to the leaves.

Inflorescence paniculate..... 1. *P. alpigena*.

Inflorescence subcorymbose..... 2. *P. Harrisii*.

[*P. americana* Mill. *Gard. Diet.* ed. 8 (1768); inflorescence many-flowered, much shorter than the leaves; flowers 6-7 mm. l.; perianth-segments equal, filaments 2 or 3 times as long as the anthers; anthers all 4-celled; fruit large, edible.—*Urb. Symb. Ant.* iv. 244. *P. gratissima* *Gaertn. f. Fruct. iii.* 222, *t. 221* (1807); *Griseb. Fl. Br. W. Ind.* 280; *Meisn. in DC. Prodr. xv. pt. 1*, 52; *Bot. Mag. t. 4580*; *Mez in Jahrb. Bot. Gart. Berl. v.* 145. *Laurus Persea L. Sp. Pl.* 370 (1753); *Ruiz & Pav. Fl. Peru. &*

*Chil. ir. t. 345*; *Tuss. Fl. Ant. iii. t. 3*; *Wright Mem. 222*. *Prunifera arbor fructu &c. Sloane Cat. 185 & Hist. ii. 132, t. 222, f. 2.* *Laurus foliis oblongo-ovatis &c. Browne Hist. Jam. 214.* (Fig. 85.) Type in *Herb. Mus. Brit.*

Avocado Pear, Alligator Pear.

In fr. Aug., Sept.; *Sloane Herb. vii. 77*! *Houstoun!* *Shakspear!* *Bancroft!* *Murray!* *Distin!* *Cuming!* *Gotte!* *Prior!* *Harris!* *Fl. Jam. 5603.*—A native of Mexico, and cultivated throughout the tropics. Grows spontaneously in the West Indies.

A handsome tree. Leaves elliptical or broadly elliptical, 7-25 cm. l., 4-15 cm. br., on upper surface glabrous, nerves flat, veins areolate, prominulous, beneath sparingly puberulous nerves prominent, veins prominulous. Inflorescence and flowers tomentellous. Flowers light green. Perianth-segments 5-5.5 mm. l., elliptical-oblong. Berry in cultivated specimens from 10 even to 20 cm. l., pear-shaped; pericarp thick, edible.

“The fruit is held in the greatest esteem ... the pulp is of a pretty firm consistence, and has a delicate rich flavour ... but is so rich and mild, that most people make use of some spice or pungent substance to give it a poignancy; and for this purpose some make use of wine, some of sugar, some of lime-juice, but most of pepper and salt. Most sorts of creatures are observed to feed on this fruit with pleasure” (Browne). “The large stone is used for marking linen. The cloth is held over the stone, and the letters pricked out by a needle through the cloth and into the seed. The stain is a reddish-brown, which never washes out” (Wright).]

1. *P. alpigena* *Spreng. Syst. ii. 268* (excl. syn. *Kunth*) (1825); inflorescence few-flowered, long-stalked, paniculate, longer than or subequalling the leaves; flowers 5 mm. l.; outer segments of perianth about half as long as the inner; filaments half as long again, to twice as long as the anthers, anthers all 4-celled.—*Griseb. loc. cit.*; *Meisn. tom. cit. 48*; *Mez tom. cit. 167.* *Laurus alpigena Sw. Fl. Ind. Occ. 704* (1798).

Wild Pear.

In fl. June-Sept.; in fr. Aug.-Jan.; *Swartz*; *Macfadyen!* *Cinchona*, J.P. 1012, *Morris!* *Hart!* *Sheldon*; *Tweedside*, 2000-2500 ft.; *Plato*; *Old England*, 3000-4000 ft.; *Green Valley*, 2000 ft.; *Berwick*, 2200 ft.; *Troy*, 1200 ft.; *Harris!* *Fl. Jam. 5235, 5468, 5487, 5492, 5509, 5826, 5840, 5842, 5854, 5957, 5971, 9485.*

Tree to 75 ft. high. Leaves elliptical or obovate-elliptical, cuneate at base, rounded at apex, on upper surface nerves impressed, veins areolate, puberulous especially on the nerves or glabrate, beneath nerves prominent, veins more or less prominulous or areolate, tomentellous, 7-12 cm. l., 4-7 cm. br. Inflorescence and flowers tomentellous. Perianth, outer segments 2.3-2.4 mm. l., inner 4-5 mm. l. Berry globose, 8-1 cm. l.

2. *P. Harrisii* *Mez in Notizbl. Berl. Bot. Gart. i. 325* (1897); inflorescence many-flowered, long-stalked, subcorymbose, longer than the leaves; flowers 4-5 mm. l.; outer segments of perianth about half as long as the inner; filaments about twice as long as the anthers; anthers all 4-celled.—*Urb. Symb. Ant. i. 308.*

Wild Pear.

In fl. July, Aug.; in fr. Oct.-April; *Cinchona*, J.P. 1263, *Hart!* *Silver Hill*, *Watt!* *Chester Vale*; *Old England*, 3500 ft.; *Clydesdale*, 4000 ft.;

Farm Hill; Silver Hill Gap, 3500 ft.; Orchard, 2500 ft.; *Harris!* Fl. Jam. 5116, 5255, 5335, 5372, 5382, 5489, 5520, 5574, 5734, 5839, 5841, 5844, 5864, 5886.

A tree 25-30 ft. high. Leaves elliptical, narrowly elliptical, or oblong-elliptical, more or less attenuated at both ends or obtuse, areolate on both surfaces, nerves impressed or flat above, prominent beneath, glabrous above, tomentellous beneath, 6-12 cm. l., 2·2-6·5 cm. br. Inflorescence tomentellous. Perianth, outer segments 1·5-2 mm. l., inner 3-4 mm. l. Berry globose, black, 1·2 cm. in diam.

3. *P. Urbaniana* Mez in *Jahrb. Bot. Gart. Berl.* v. 143 (1889); inflorescence few-flowered, much shorter than the leaves, branchlets 1-flowered at the apex or with a few subumbellate flowers; flowers 3-4 mm. l.; outer segments of perianth about  $\frac{1}{3}$  as long as the inner; filaments a little longer than the anthers; anthers of the inner ring 2-celled.

"Jamaica, Dr. Wright?" in *Herb. Kew.*!—Martinique.

A tree or shrub. Leaves broadly elliptical, nerves impressed above, prominent beneath, veins inconspicuous, glabrous above except sparingly puberulous on central nerve, puberulous beneath, 12-18 cm. l., 4-8 5 cm. br. Berry globose, transversely compressed, 1·5 cm. l., 1·6-1·7 cm. br.

#### 4. PHŒBE Nees.

Leaves in *P. montana* subtriplinerved. Perianth persistent in fruit, segments equal. Stamens 9; anthers of the outer ring 4-celled,

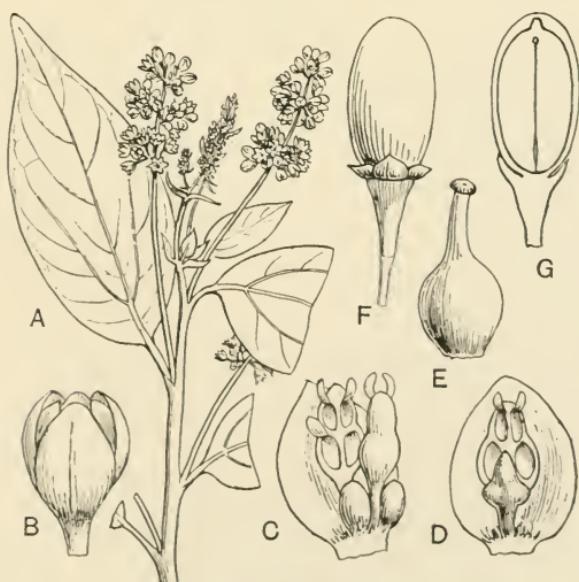


Fig. 86.—*Phœbe montana* Griseb.

A, Portion of flowering branch  $\times \frac{1}{2}$ .

B, Flower-bud  $\times 10$ .

C, Perianth-segment with an outer and an inner stamen  $\times 10$ .

G, Fruit cut lengthwise  $\times \frac{1}{2}$ .

D, Alternate perianth-segment with an outer stamen and a staminode  $\times 10$ .

E, Pistil  $\times 10$ .

F, Fruit  $\times \frac{1}{2}$ .

those of the inner ring generally 4-celled and opening outwards or laterally; staminodes conspicuous, cordate-sagittate on a broad stalk. Berry ellipsoidal; perianth-segments in *P. montana* enlarged only at base, not lengthened, and the pedicel somewhat thickened.

Species 82, the majority natives of tropical America (four in the West Indies), the rest in the East Indies and the Malay Archipelago.

*P. montana* Griseb. *Fl. Br. W. Ind.* 279 (1860); Meisn. in *DC. Prodr.* xv. pt. 1, 31; Mez in *Jahrb. Bot. Gart. Berl.* v. 210; *Urb. Symb. Ant.* iv. 245. *Laurus montana* Sw. *Prodr.* 65 (1788) & *Fl. Ind. Occ.* 700. *Cinnamomum montanum* Nees *Syst.* 81 (1836). (Fig. 86.)

In fl. Mar.; in fr. July-Feb. *Swartz!* *Macfadyen!* *March!* Old England; Green Valley; Farm Hill; *Harris!* Fl. Jan. 5099, 5187, 5259, 5540.—Cuba, Hispaniola, Porto Rico.

A tree 12-25 ft. high. Leaves elliptical, acuminate, on the upper surface glabrate, beneath tomentellous, nerves and veins above impressed, beneath nerves prominent and veins obscure, 5-10 cm. l., 2-4.5 cm. br. Inflorescence pubescent, many-flowered, pyramidate-paniculate, generally shorter than the leaves. Flowers greenish or white, puberulous. Perianth-segments about 2 mm. l., elliptical. Filaments about as long as the anthers, hairy, the inner with 2 elliptical flat glands. Berry about 1 cm. l., about .7 cm. br.

## 5. OCOTEA Aubl.

Leaves for the most part glabrous. Flowers dioecious or hermaphrodite. Perianth, tube (in Jamaican species) very short or none; segments subequal, deciduous or persistent. Stamens 9; anthers 4-celled, the cells superposed in pairs; staminodes none or minute; stamens in the female flower generally reduced to scale-like staminodes. Berry globose or ellipsoidal; cupule flat, saucer-shaped or cup-shaped, with simple or double margin; perianth-segments deciduous or sometimes persistent, enlarged and reflexed; pedicel slightly thickened or expanding above to the diameter of the cupule.

Species about 250, natives of the West Indies and tropical America, one species occurring in the Canary Is., two in tropical Africa, one in South Africa, three in Madagascar and two in Bourbon.

Anthers normal.

Nerve-axils glabrous.

- Upper surface of leaves with nerves flat and veins impressed. Cupule 5-7 mm. in diam. simple-margined..... 1. *O. leucoxylon*.
- Upper surface of leaves areolate. Cupule 6-8 mm. in diam., 2-margined..... 2. *O. floribunda*.
- Upper surface with nerves and veins prominulous. Cupule 4.5 mm. in diam., flat ..... 3. *O. jamaicensis*.
- Nerve-axils of leaves on lower surface hairy..... 4. *O. martinicensis*.
- Outer anthers sessile, oblong-elliptical, cells much below apex ..... 5. *O. staminea*.

1. *O. leucoxylon* Mez in *Jahrb. Bot. Gart. Berl.* v. 329 (1889); leaves oblong-elliptical to oblong-lanceolate, on upper surface nerves flat and veins impressed, beneath nerves and veins prominent; inflorescence more or less rusty-puberulous, shorter than or subequal to leaves; flowers diocious, with or without tomentum; filaments glabrous; staminodes very small or abortive; berry globose; cupule saucer-shaped, simple-margined, with perianth-segments deciduous, 5-7 mm. in diam., pedicel somewhat thickened; cupule and pedicel generally

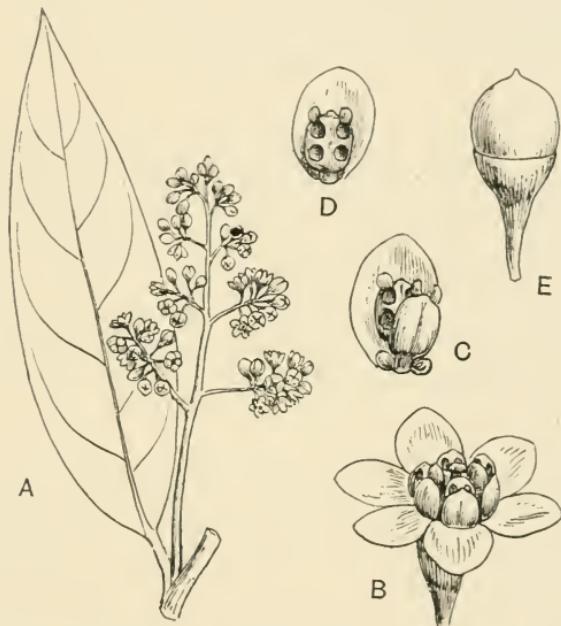


Fig. 87.—*Ocotea leucoxylon* Mez.

A, Portion of flowering branch  $\times \frac{2}{3}$ .  
 B, Flower  $\times 5$ .  
 C, Perianth-segment with an outer and an inner stamen  $\times 5$ .

D, Alternate perianth-segment with an outer stamen (staminode wanting)  $\times 5$ .  
 E, Fruit  $\times \frac{2}{3}$ .

covered with white warts.—*Laurus foliis venosis &c.* *Browne Hist. Jam.* 214? *Laurus leucoxylon Sw. Prodr.* 65 (1788) & *Fl. Ind. Occ.* 711. *L. parviflora Sw. Fl. Ind. Occ.* 717 (1800). *L. exaltata* var. *lancifolia* *Poir. Encyc. Suppl. iii.* 319 (1813). *Oreodaphne leucoxylon* *Nees Syst.* 413 (1836); *Griseb. Fl. Br. W. Ind.* 283; *Meisn. in DC. Prodr. xv. pt. 1.* 121. *O. parviflora* *Nees Syst.* 415 (1836); *Meisn. loc. cit.*; *Griseb. loc. cit.* (Fig. 87.)

White-wood, Loblolly Sweet-wood.

In fl. April, July-Sept.; in fr. Aug.-May; Wright! Swartz! Bancroft! Macfadyen! Wilson! Prior! March! J.P. 718 Morris! Whitfield Hall

Works; Spanish River; below Vinegar Hill, 4000 ft.; St. George; Mt. Moses; Chepstow, 800 ft.; near New Market, 1200 ft.; Toms Cave, Clarendon, 2500 ft.; Peckham, Clarendon, 2500 ft.; *Harris!* Fl. Jam. 5220, 5320, 5466, 5588, 5683, 5855, 5984, 9839, 10,854, 10,963.—Cuba, Hispaniola, Porto Rico, St. Thomas, Guadeloupe, Dominica, Martinique, Grenada.

A tree to 80 ft. high. *Leaves*, base obtuse or rounded or rarely acute, apex obtuse or acute, 1-2 dm. l., 3-9 cm. br. *Flowers* pale yellow, yellowish-green or white. *Male flowers*: *perianth*, tube almost none; segments 2 mm. l., elliptical-oblong; *stamens* 1-5 mm. l.; anthers subrectangular; *pistil* sterile, stalk-like, with a discoid stigma. *Female flowers*: *stamens* minute, sterile. *Berry* black, about 1 cm. l.; cupule greenish-brown.

This species is used as a timber-tree. It splits and saws freely, so that shingles and staves are made from it, and headings of hogsheads and barrels. Boards, however, do not last well.

2. *O. floribunda* Mez in *Jahrb. Bot. Gart. Berl.* v. 325 (1889); leaves lanceolate to oblong-elliptical, on upper surface areolate, beneath nerves and veins prominulous-reticulate; inflorescence sparingly puberulous above, shorter than the leaves; flowers dioecious, sparingly puberulous; filaments glabrous; staminodes stalk-like, glabrous, or abortive; berry subglobose; cupule flat, 2-marginal, with the enlarged reflexed perianth-segments occasionally persistent; pedicel scarcely thickened.—*Urb. Symb. Ant.* iv. 246. *Laurus floribunda* Sw. *Prodr.* 65 (1788) & *Fl. Ind. Occ.* 721. *Strychnodaphne floribunda* Griseb. *loc. cit.* (1860); *Meisn. tom. cit.* 143.

Black Sweet-wood, Black Candle-wood.

In fl. Oct.-Jan.; in fr. March; *Wright!* *Swartz!* *Purdie!* *Wullschaegel!* *Prior!* *March!* Green Valley, 2000 ft. *Harris!* John Crow (Blake) Mts., 1200 ft., *Harris & Britton!* Fl. Jam. 5799, 5923, 10,706.—Cuba, Hispaniola, Porto Rico, Guadeloupe, Martinique, Trinidad, Venezuela, Guiana, Nicaragua.

A tree 30-60 ft. high. *Leaves* base acute, apex acuminate, with very sparse reddish hairs when young, 6-18 cm. l., 2-6 cm. br. *Flowers* greenish-white. *Male flowers*: *perianth*, tube very short; segments 2.3-2.4 mm. l., elliptical and broadly elliptical; *anthers* subrectangular; *filaments* those of the inner ring with 2 large glands; *pistil* sterile with stigma well developed. *Female flowers*: *stamens* developed, but anthers without valves. *Berry* globose, 1-3 cm. l., 1 cm. br.; cupule flat, spreading above the slightly thickened pedicel, double-margined, and often with the enlarged reflexed, perianth-segments still remaining.

The specimens from Wright and Swartz have monstrous flowers which are larger, with all the *stamens* transformed into perianth-like scales.

3. *O. jamaicensis* Mez in *Bull. Herb. Boiss. sér. 2, v. 241* (1905); leaves elliptical or oblong-elliptical, nerves and veins very slightly prominulous above, prominent beneath; inflorescence white-tomentellous, generally longer than the leaves; flowers subdioecious, white-tomentellous; filaments slightly hairy at the back; staminodes conspicuous; berry ellipsoidal; cupule small, flattish, 4.5 mm. in diam.; pedicel somewhat thickened.

In fl. July; in fr. April, July; Silver Hill; Woodcutters Gap, near Newcastle; *Harris!* Fl. Jam. 5114, 5267.

A tree or shrub. Leaves, base wedge-shaped, apex more or less acuminate, 6-16 cm. l., 2·5-5·5 cm. br. Flowers small, scarcely 2 mm. l. Perianth, tube very short; segments scale-like, roundish. Anthers broadly roundish. Berry 1·4 cm. l., 8-9 cm. br.

4. *O. martinicensis* Mez in *Jahrb. Bot. Gart. Berl.* v. 270 (1889); leaves elliptical or oblong-elliptical or obovate-elliptical, nerves and veins slightly prominulous above, prominent beneath, glabrous except usually hairy in the nerve-axils beneath; inflorescence above more or less tomentellous, shorter than the leaves; flowers hermaphrodite, tomentellous; filaments hairy; berry ellipsoidal; cupule saucer-shaped, simple-margined, with perianth-segments deciduous, attenuated into the very thick pedicel.

*Wright!* *Dancer!*—Guadeloupe, Dominica, Martinique.

A very large tree. Leaves, base wedge-shaped, apex acute or very shortly acuminate, 10-19 cm. l., 5·5-12 cm. br. Flowers 3 mm. l. Perianth, tube very short; segments ovate, acute. Anthers broadly sub-rectangular. Filaments of the inner ring bi-glandular. Berry 2·5 cm. l., 1·4 mm. br.

5. *O. staminea* Mez in *Jahrb. Bot. Gart. Berl.* v. 240 (1889); leaves oblong to elliptical, on upper surface nerves impressed or flat and veins obscure or prominulous, beneath nerves prominulous and veins prominent; inflorescence white-puberulous or tomentellous, generally shorter than the leaves; flowers hermaphrodite, sparingly puberulous; outer anthers sessile, oblong-elliptical with cells much below apex; staminodes linear, hairy; berry oblong-ellipsoidal; cupule cup-shaped, 2-margined, perianth-segments enlarged and persistent; pedicel enlarged above to diameter of cupule.—*Nectandra staminea* Griseb. *op. cit.* 282 (1860). *Oreodaphne fragrans* Meisn. *tom. cit.* 127 (1864). *Synandrodaphne antillana* Meisn. *tom. cit.* 176 (1864). *Persea* sp. *Benth.* in *Benth. & Hook. f. Gen. Pl.* iii. 158 (1880). *P. staminea* Fawc. *Fl. Pl. Jam.* 33 (1893).

Lignum dorum, Spice wood.

In fl. Jan., Feb., June, July, Sept.; in fr. Jan.; McNab; Kew, Westmoreland, *Purdie!* *Prior!* *March!* Ramble, Claremont, 1700 ft., Fawcett & *Harris!* Schwanenburg, St. Ann, 2300 ft.; Lapland; Peckham, Clarendon, 2500 ft.; *Harris!* Fl. Jam. 7029, 7169, 7689, 9184, 10,959, 11,187.

A tree 20-40 ft. high. Leaves, base generally wedge-shaped, apex acute or very shortly acuminate, 7-24 cm. l., 2·5-8·5 cm. br. Flowers about 9 mm. in diam., white, very fragrant. Perianth, tube none; segments roundish-elliptical, outer nearly 3 mm. l., inner 2 mm. l. Siamens 1·5 mm. l., those of the inner ring dehiscing extrorsely and laterally, with 2 large glands at the base; staminodes linear, hairy, more than 1 mm. l. Berry oblong-ellipsoidal, mucronate, 2·5-2·7 cm. l., about 1 cm. br.; cupule cup-shaped, formed of the enlarged base of the perianth, with

a double margin, and the perianth-segments enlarged and more or less persistent; pedicel enlarged above to the diameter of the cupule.

The timber is used for inside work, also for shingles.

## 6. NECTANDRA Roland.

Leaves glabrous or sparingly hairy. Perianth thick, somewhat fleshy; tube short, sometimes almost none; segments subequal, spreading, deciduous in fruit. Stamens 9, much shorter than the perianth, anthers 4-celled, the cells, at any rate

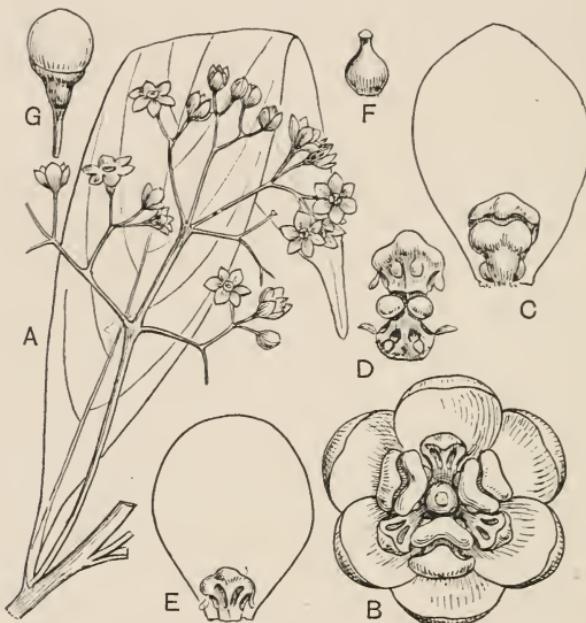


Fig. 88.—*Nectandra antillana* Meisn.

A, Portion of flowering branch  $\times \frac{2}{3}$ .

B, Flower  $\times 5$ .

C, Perianth-segment with an outer and an inner stamen  $\times 5$ .

D, Stamens in C with the inner pulled down  $\times 5$ .

E, Alternate perianth-segment with an outer stamen  $\times 5$ .

F, Pistil  $\times 5$ .

G, Fruit  $\times \frac{2}{3}$ .

of the outer ring, arranged in a bow-shaped curve; staminodes none or small; filaments very short or wanting. Berry globose or ellipsoidal; cupule simple-margined, saucer-shaped, generally red; pedicel slightly thickened or expanding above to the diameter of the cupule.

Species about 86, natives of tropical America, especially the Andes, a few in Mexico and the West Indies, and a few reaching to Argentina and Paraguay.

Leaves with nerves prominent beneath, otherwise nerves and veins flat or impressed. Filaments wanting or glabrous.

Flowers 8–10 mm. in diam. Anthers sessile ..... 1. *N. antillana*.

Flowers 4–5 mm. in diam. Filaments glabrous ... 2. *N. membranacea*.

Leaves with nerves and veins prominent on both sides. Filaments hairy.

Flowers 4–5 mm. in diam. Filaments of outer ring about half as long as anthers ..... 3. *N. patens*.

Flowers 6 mm. in diam. Filaments subequalling anthers ..... 4. *N. martinicensis*.

Flowers 10–12 mm. in diam. Filaments subequalling anthers.

Leaves membranous or chartaceous, axils of nerves beneath generally hairy. Inflorescence white-strigose-tomentellous, subequalling the leaves or shorter ..... 5. *N. sanguinea*.

Leaves leathery, glabrous. Inflorescence glabrescent, evidently shorter than the leaves ..... 6. *N. coriacea*.

1. *N. antillana* Meisn. in DC. Prodr. xv. pt. 1, 153 (1864); leaves, on upper surface nerves flat, beneath prominent, veins impressed above and flat beneath; inflorescence very sparingly puberulous or subglabrous; flowers 8–10 mm. in diam.; anthers sessile; berry globose.—Mez in Jahrb. Bot. Gart. Berl. v. 425; Urb. Symb. Ant. iv. 248. *N. leucantha* Griseb. Fl. Br. W. Ind. 282 (1860) (excl. syn. *Miq.* & var.) (non Nees). *Laurus folio longiore* &c. Sloane Cat. 136 & Hist. ii. 21, t. 165. *L. foliis oblongo-ovatis* &c. Browne Hist. Jam. 213. (Fig. 88.)

Shingle-wood, White-wood, Long-leaved Sweet-wood. In fl. Jan., Apr., May; in fr. May, Sept.; common up to 3000 ft.; Red Hills, Rio Cobre, Sloane Herb. v. 72! Wright! Dancer! Macfadyen! Distin! Hartweg! Woods above Spanish Town, Purdie! also Lane! Heward! Wilson! Wulfschlaegel; Moneague, Prior! March! J.P. 723 Morris! Claverty Cottage, Blue Mts., J.P. 1448, Hart! near Castleton; near Port Morant; Falls River, Blue Mts.; Content Road, 2000 ft.; Harris! Ramble, Claremont, 1700 ft., Fawcett & Harris! Fl. Jam. 5126, 5195, 5198, 5346, 5813, 7027a; near Moneague, Britton, 2653!—Cuba, Hispaniola, Porto Rico, St. Thomas, Guadeloupe, Martinique.

Tree 20–40 ft. high. Leaves 7–20 cm. l., 2–7 cm. br., glabrous or sometimes slightly puberulous on midrib, oblong, oblong-elliptical, oblong-lanceolate or broadly lanceolate, apex acuminate, attenuated to base. Flowers whitish. Perianth-segments roundish-ovate, tomentellous on both sides, 4·5 mm. l., 3·5–4 mm. br. Berry blue-black, 7–9 mm. in diam.; cupule red, saucer-shaped, 7–8 mm. in diam.; pedicel slightly thickened.

When well grown, this tree attains a diameter of 3 ft.; it splits and saws freely and is therefore used for shingles, staves and boards; the wood is not, however, very durable in exposed situations.

2. *N. membranacea* Griseb. Fl. Br. W. Ind. 282 (1860); leaves, upper surface smooth with nerves impressed or flat, beneath nerves prominent, veins flat; inflorescence tomentellous or glabrous; flowers 4–5 mm. in diam.; anthers subsessile, with glabrous filaments; berry globose.—Meisn. tom. cit. 161; Mez

tom. cit. 450; *Urb. loc. cit.* *U. leucantha*, var. *Rodiae* *Griseb.* loc. cit. *Laurus membranacea* *Sw. Prodr.* 65 (1788) & *Fl. Ind. Occ.* 713; *Lunan Hort. Jam. i.* 79. *Oreodaphne strumosa* *Griseb. op. cit.* 284 (in note on *O. parviflora*). *O. coriacea* *Griseb. Pl. Carib.* 72 (1857) (non *Nees*).

In fl. July-Oct.; *Swartz!* Cascade R., Blue Mts.; Olive R., Christiana district, 3000 ft.; *Harris!* *Fl. Jam.* 5344, 8299.—Hispaniola, Porto Rico, St. Thomas, Guadeloupe, Dominica, Martinique, St. Vincent, Barbados, Grenada, Trinidad.

A large timber tree to 60 ft. high. Leaves 8-24 cm. l., 2-8 cm. br., glabrous or very sparingly puberulous, elliptical to lanceolate, apex acuminate, attenuated to base. Inflorescence shorter than the leaves or about equalling them. Flowers yellowish-white. Perianth-segments, outer ovate-elliptical, 1.75 mm. l., white strigillose on outside, glabrous within, inner roundish above, slightly attenuated to base, 1.4 mm. l., puberulous on outside, sparingly on inside. Berry black, 1 cm. in diam.; cupule 6-7 mm. in diam., saucer-shaped; pedicel thickened above to diameter of cupule.

3. *N. patens* *Griseb. Fl. Br. W. Ind.* 281 (1860); leaves with nerves and veins prominulous on both sides, reticulate in large meshes; inflorescence sparsely puberulous; flowers 4-5 mm. in diam.; anthers with hairy filaments; berry ellipsoidal.—*Meisn. tom. cit.* 164; *Mez tom. cit.* 455; *Urb. loc. cit.* *N. coriacea* *Meisn. tom. cit.* 163 (non *Griseb.*). *Laurus patens* *Sw. Prodr.* 65 (1788) & *Fl. Ind. Occ.* 715; *Lunan Hort. Jam. i.* 70.

Cap-berry, Sweetwood.

In fl. June-Nov.; in fr. June, Aug., Jan.-April; *Swartz!* *Macfadyen!* Kirk Spring, St. Mary, *McNab!* Morse's Gap, *Purdie!* *Prior!* *J.P.* 883, 991, 1096, *Morris!* Gordon Town, *Moore!* Claverty Cottage; Chester Vale; Old England; Plato; Woodcutters Gap; St. George; Lancaster; Berwick; Tweedside; Browns Town; Troy; Peckham, Clarendon; *Harris!* John Crow (Blake) Mts., *Harris & Britton!* *Fl. Jam.* 5327, 5339, 5359, 5369, 5381, 5433, 5530, 5560, 5587, 5682, 5917, 6066, 6344, 7081, 8742, 8746, 10,712, 10,957; Fern Gully, Ocho Rios; *Britton & Hollick*, 2698! Potsdam, 2600 ft., *Harris!* *Fl. Jam.* 9748 (monstrosity, flowers passing into bracts).—Hispaniola, Porto Rico, Martinique.

Shrub or tree 10-40 ft. high. Leaves ovate to elliptical, base more or less shortly acute, apex more or less acuminate, glabrous except sometimes hairy in the axils of the nerves beneath, 7-19 cm. l., 3-9 cm. br. Perianth-segments oblong-elliptical, tomentellous on both sides, 2 mm. l. Anthers suborbicular, those of the inner ring subintorse. Berry white (*Harris*), 2-2.5 cm. l.; cupule red, saucer-shaped, 4-5 mm. in diam.; pedicel thickened upwards passing into the cupule.

4. *N. martinicensis* *Mez in Jahrb. Bot. Gart. Berl. v.* 459 (1889); leaves membranous or membranous-chartaceous, with nerves and veins prominent on both sides, with wide meshes, glabrous on both sides, but sometimes very sparingly strigillose beneath; inflorescence white-strigose-tomentellous; flowers 6 mm. in diam.; filaments hairy, about as long as the anthers; berry not known.—*Laurus martinicensis* *Jacq. Coll. ii.* 109, *t. 5, f. 2.*

Fl. Jam. 5038 (in Herb. Kew.)!—Martinique (Jacq.), Trinidad, Panama. Tree 40–50 ft. high. Leaves elliptical, shortly acuminate, 9–18 cm. l., 4·5–5·3 cm. br. Inflorescence laxly subpyramidal-corymbose, about equalling the leaves or shorter; pedicels 2–4 mm. l.

This species appears to us to be closely allied to, and even perhaps only a form of, *N. sanguinea* Roland.

5. *N. sanguinea* Roland ex Rottb. in *Act. Litt. Univ. Hafn.* i. 279 (1778); leaves membranous or chartaceous, with nerves and veins prominent on both sides, with wide meshes, lower axils of nerves beneath generally hairy, midrib beneath sometimes strigillose; inflorescence white-strigose-tomentellous; flowers 10 mm. in diam.; filaments hairy, about as long as, or a little shorter than, the anthers; berry roundish-ellipsoidal.—*Griseb. loc. cit.* (in part); *Meisn. tom. cit.* 164; *Mez tom. cit.* 457. *N. exaltata* *Griseb. loc. cit.* (in part, not *Cat. Cub. iii.*) (1860); *Meisn. tom. cit.* 165. *Laurus exaltata* *Sw. Prodr.* 65 (1788) & *Fl. Ind. Occ.* 702. *L. sanguinea* *Sw. Fl. Ind. Occ.* 707 (1798).

#### Timber Sweet Wood.

In fl. May; *Houston!* *Wright!* *Swartz!* *Wullschlaegel!* “*Hort. Bot.*,” *Jenman!*—Mexico, Nicaragua, British Guiana, Surinam, Colombia.

A tree, 25 ft. high, or shrub, with the young twigs white-strigose-tomentellous. Leaves variable in shape, elliptical to elliptical-lanceolate, acute at both ends or shortly acuminate, 8–14 cm. l., 2·5–5·5(7) cm. br. Inflorescence subcorymbose-paniculate, about equal to, or shorter than, the leaves; pedicels 2–4 mm. l. Perianth-segments oblong or obovate-oblong, tomentellous on both sides, about 2·5–3·5 mm. l. Berry about 12 mm. l., 10 mm. br.; cupule saucer-shaped, about 5 cm. in diam.; pedicel slightly thickened.

The wood is hard, and esteemed for domestic use, buildings, &c. The colour is brownish with a tinge of green.

6. *N. coriacea* *Griseb. Fl. Br. W. Ind.* 281 (1860) (with reference only to the syn. *Laurus coriacea* *Sw.*) (non *Meisn.*); leaves leathery, with nerves and veins prominent on both sides, with large meshes, glabrous; inflorescence sparsely white-strigose or glabrescent; flowers 10–12 mm. in diam.; anthers with hairy filaments; berry ellipsoidal.—*Mez tom. cit.* 459; *Urb. tom. cit.* 249. *N. Willdenoviana* *Nees Syst.* 321 (non 290) (1836); *Meisn. in DC. Prodr. xv. pt. 1, 165.* *N. sanguinea* *Griseb. loc. cit.* (1860) (in part) (non *Roland*). *Laurus coriacea* *Sw. Prodr.* 65 (1788) & *Fl. Ind. Occ.* 710. *Oreodaphne coriacea* *Nees Syst.* 454 (1836) (so far as regards syn. *Swartz*).

Sweetwood, Cap-berry Sweetwood, Small-leaved Sweetwood.

In fl. April-June; in fr. July, Jan., April; *Shakspear!* *Swartz!* *Caley!* *Bancroft!* *Macfadyen!* *Distin!* near Spanish Town, *Hartweg!* 1566! Portland; Browns Town; *Purdie!* *Forsyth!* *Wilson!* *Wullschlaegel!* Moneague, *Prior!* *March!* Green Valley; Davids Hill; J.P. 1385, 1426, *Morris!* Chester Vale; Old England; Robertsfield; Green Valley; Hall's Delight, 1000 ft.; Middleton, 2000 ft.; Watson's Hill, Manchester, 1000 ft.;

Mavis Bank, 2000 ft.; Papine, 1000 ft.; Troy, 2000 ft.; Harris! Long Mt., 360 ft., Campbell! Fl. Jam. 5098, 5112, 5119, 5207, 5210, 5254, 5508, 5674, 5798, 5809, 6321, 7255, 8374, 8746.—West Indies, Yucatan.

A small tree to 30 ft. high. Leaves elliptical, ovate-elliptical to lanceolate-elliptical, acuminate, 6-12 cm. l., 2·5-4·5 cm. br. Inflorescence glabrescent, evidently shorter than the leaves; pedicels 3-8 mm. l. Flowers white, with yellow anthers and rosy pedicels, sweet-scented like Jasmine. Perianth-segments oblong-elliptical, tomentellous on both sides, inner about 3 mm. l., outer about 2 mm. l. Berry black, to 1·5 cm. l., about 1 cm. br.; cupule red, saucer-shaped, about 5 cm. in diam.; pedicel thickened upwards, passing into the cupule.

This species seems to us to be so nearly allied to *N. sanguinea* Roland, that it might perhaps be considered only a form of it.

### 7. CASSYTHA L.

Climbing, parasitical herbs. Stems twining, slender, adhering by means of suckers ("haustoria"). Leaves represented by minute scales. Flowers in spikes or racemes. Perianth, tube

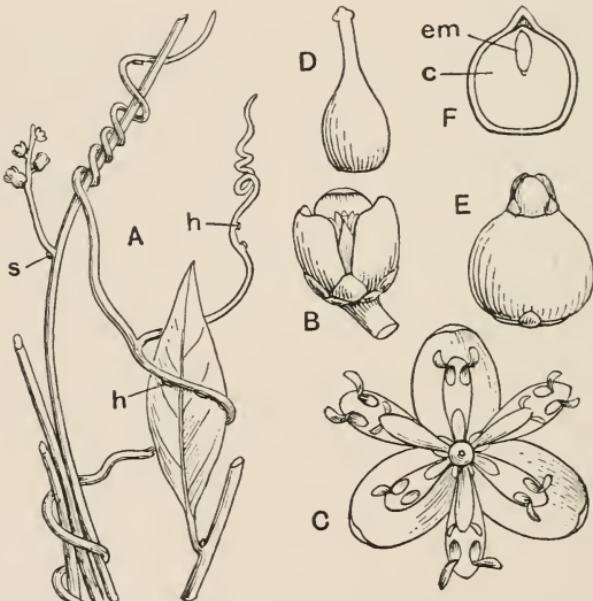


Fig. 89.—*Cassytha filiformis* L.

A, Portion of stem with flowers showing attachment to leaf of host-plant by haustoria (h); s, leaf-scale  $\times \frac{1}{2}$ .

B, Flower  $\times 6$ .  
C, Do. flattened out  $\times 7$ .

D, Pistil  $\times 18$ .

E, Fruit  $\times 2$ .

F, Seed in section, showing the inner face of a cotyledon (c), and axis of embryo (em).

increasing in fruit and becoming constricted at the apex; segments 6, the 3 exterior much the smaller. Perfect stamens 9, the outer without glands and the 2-celled anthers introrse;

the inner glandular and the 1-celled anthers extrorse ; staminodes large. Fruit globose, enclosed by the succulent perianth-tube, and crowned by the persistent segments.

Species 16, one cosmopolitan in the tropics, one in tropical Africa, two in South Africa, one in Ceylon and Borneo, and the rest Australian.

*C. filiformis* L. *Sp. Pl.* 35 (1753) ; *Jacq. Sel. Stirp. Amer.* 115, *t.* 79 & *Ed. piet.* *t.* 116 ; *Nees Syst.* 642 ; *Meisn. in DC. Prodr.* *xv. pt. 1.* 255 ; *Benth. Fl. Austral.* *v.* 311 ; *Hook. f. Fl. Brit. Ind.* *v.* 188 ; *Stapf in Fl. Trop. Afr.* *vi. Sect. 1.* 188 & *in Fl. Cap.* *v.* *Sect. 1.* 500. *C. americana* *Nees Syst.* 644 (1836) ; *Griseb. Fl. Br. W. Ind.* 285 ; *Meisn. op. cit.* 256 & *in Fl. Bras.* *v.* *pt. 2.* 295, *t.* 107 ; *Mez in Jahrb. Bot. Gart. Berl.* *v.* 490 & *in Urb. Symb. Aut.* *iv.* 249. *Cuscuta baccifera* *Barbadensium &c.* *Pluk. Alm.* 126, *t.* 172, *f.* 2 (specimen in Hb. Sloane xcv. 205). (Fig. 89.)

In fl. Oct.-Dec. ; Pedro plain, *Purdie* ! Healthshire Hills, 50 ft. ; Corby, 1500 ft., *Harris* ! *Fl. Jam.* 9525, 9684.—Cosmopolitan in the tropics.

Stem 5-2 mm. thick. Flowers about 2 mm. l. Fruit 6 mm. in diam.

#### FAMILY XXIX. HERNANDIACEÆ.

Trees or shrubs. Leaves alternate, 3-7-nerved at or a little above the base, pinnately nerved above, without stipules. Cymes long-stalked, corymbose or panicled, axillary. Perianth superior, segments generally in two valvate 3-5-parted whorls. Stamens opposite the outer segments. Anthers 2-celled, opening inwards by valves. Staminodes more or less glandular, in 1 or 2 whorls usually outside the stamens, or wanting ; those of the outer whorl in pairs at the base of the stamens, those of the inner whorl alternate with the stamens. Ovary inferior, 1-celled ; ovule solitary, pendulous. Fruit dry. Seed solitary, without endosperm. Embryo straight ; cotyledons large, lobed (in *Hernandia*).

Species about 35, natives of the tropics.

#### HERNANDIA L.

Trees. Leaves entire. Cymes corymbose, bracteate ; cymules surrounded by an involucre of 4-5 bracts, usually 3-flowered, the central flower female, the two lateral male. Flowers monœcious. Male flower : perianth-segments 6 or 8 ; stamens 3 or 4 ; staminodes twice as many as the stamens and attached one on either side at the base of each filament, or as many and alternate, or absent. Female flower surrounded at the base by a cupular involucre ; perianth-segments 8 or 10 ; staminodes 4 or 5,

opposite the outer segments; stigma dilated, irregular. Fruit more or less distinctly 8-ribbed, surrounded by the much increased inflated involucel. Cotyledons lobed.

Species 14, in the tropics.

Leaves 3-nerved at base..... 1. *H. jamaicensis*.  
Leaves 5-nerved at base..... 2. *H. catalpifolia*.

1. *H. jamaicensis* Britton & Harris in Torr. Bot. Cl. Bull. xxxv. 338 (1908); leaves 3-nerved at or near the base. (Fig. 90, G. H.)

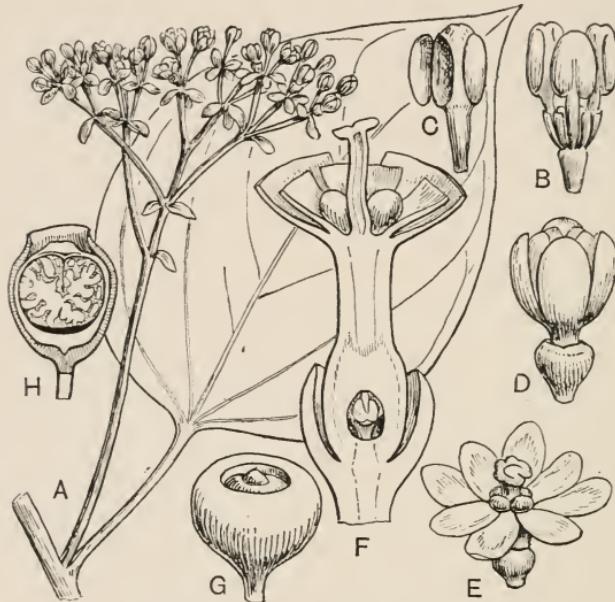


Fig. 90.—*Hernandia catalpifolia* Britton & Harris.

A, Inflorescence in axil of leaf  $\times \frac{2}{3}$ .  
B, Male flower-bud with perianth removed  $\times 3$ .  
C, Stamen with anther-cell dehisced  $\times 3$ .  
D, Female flower, opening bud  $\times 3$ .  
E, Female flower  $\times 3$ .  
F, Female flower, cut lengthwise and perianth partly removed  $\times 10$ .  
G, Fruit of *H. jamaicensis* Britton & Harris  $\times \frac{2}{3}$ .  
H, Ditto, cut lengthwise  $\times \frac{2}{3}$ .

In fr. March; Wright! Woodstock, Westmoreland, Harris! Fl. Jam. 9835, 10,312.

Tree 25-80 ft. high, "with spreading and ascending stout branches, the trunk becoming at least a metre in diameter, the young twigs more or less flattened and angled." Leaves somewhat leathery, broadly elliptical to oblong-elliptical, sometimes somewhat obovate, apex obtuse to truncate-rounded, base obtuse to wedge-shaped, strongly triplinerved, nerves and veins flat and somewhat obscure on the upper surface, prominent beneath, glabrous, 8-22 cm. l., 3-9 cm. br.; petiole glabrous, 3-12 cm. l. Inflorescence (incl. peduncle) 15 cm. l. Involucral bracts oblong, 4-5 mm. l., minutely tomentellous, as are also the flowers. Fruit subglobose, about 2 cm. l., enveloped by the yellow involucel.

2. *H. catalpifolia* Britton & Harris in *Torreya* ii. 174, (1911); leaves 5-nerved at or near the base. (Fig. 90, A-F.)

In fl. Sept.; in fr. March; *von Rohr*! between Sunning Hill and Water Valley, St. Thomas; north side of Cuna Cuna pass; south-eastern foothills of John Crow (Blake) Mts.; *Harris & Britton*! Fl. Jam. 10,566, 10,588, 10,685.

Tree 30-50 ft. high. *Twigs*, when young, very minutely puberulous. *Leaves* chartaceous, broadly elliptical or roundish-elliptical, or broadly ovate, apex sometimes very shortly acuminate, base rounded, obtuse, or subtruncate, nerves and veins flat above, prominent beneath, minutely puberulous on nerves beneath when young, at length glabrous, 9-21 cm. l., 6-15.5 cm. br.; petiole minutely tomentellous, 3-11 cm. l. *Inflorescence* (incl. peduncle) tomentellous, 9-18 cm. l. *Involucral bracts* obovate-elliptical, 6 mm. l. *Male flower*: perianth-segments 6, white, outer elliptical, 5 mm. l., 3 mm. br., inner oblong-elliptical, rather shorter and narrower; stamens 3. *Female flower*: perianth-segments 8, similar to those of the male flower but narrower, white; *staminodes* 4, subglobose, fleshy. *Fruit* subglobose, about 2 cm. l., enveloped by the involucel.

FAMILY XXX. PAPAVERACEÆ.

Herbs, sometimes shrubs, often with coloured juice. Leaves alternate, often lobed; stipules wanting. Flowers hermaphrodite, regular. Sepals 2 or 3, free, imbricate, very caducous. Petals 4-6 or wanting, hypogynous, free, imbricate, deciduous. Stamens hypogynous, numerous, free. Ovary free, 1-celled, with parietal placentas. Fruit capsular, dehiscing by pores or valves. Embryo generally minute, but large in *Argemone*; endosperm fleshy, oily.

Species about 300, growing in the temperate and subtropical regions of the northern hemisphere, and a very few within the tropics and in the southern hemisphere.

Petals present..... 1. *Argemone*.  
 Petals wanting..... 2. *Bocconia*.

#### 1. ARGEMONE L.

Glaucous herbs (rarely shrubby), with light yellow juice. Leaves sessile, inciso-pinnatifid with spiny teeth. Ovary with 4-7 placentas; ovules numerous; stigmas distinct. Capsule opening by 4-7 short valves at the apex, leaving a replum of as many filiform placentas. Embryo cylindrical in the axis of the endosperm, and two-thirds its length.

Species 9, all American, of which one is found naturalised in all tropical lands.

*A. mexicana* L. Sp. Pl. 508 (1753); Mill. Ic. 33, t. 50; Lam. Encyc. Ill. t. 452; Bot. Mag. t. 243; Wright Mem. 189,

*Macf. Jam. i. 20; A. Gr. Gen. 112, t. 47; Griseb. Fl. Br. W. Ind. 13; Baill. Hist. iii. 113, figs. 125-127; Urb. Symb. Ant. iv. 250; Fedde in Engl. Pflanzenreich iv. pt. 104, 273, fig. 36b.* Argemone

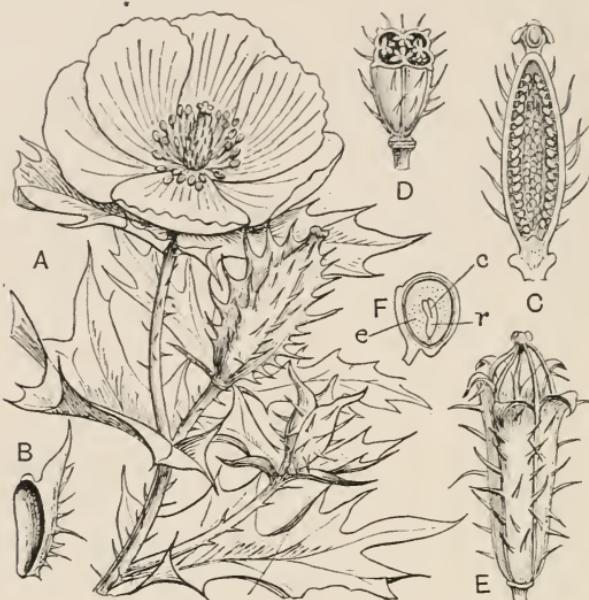


Fig. 91.—*Argemone mexicana* L.

A, Upper portion of plant with bud, fruit and flower  $\times \frac{2}{3}$ .  
 B, Sepal  $\times \frac{2}{3}$ .  
 C, Pistil cut lengthwise  $\times \frac{2}{3}$ .  
 D, Ditto, cut across  $\times \frac{2}{3}$ .  
 E, Ripe capsule  $\times \frac{2}{3}$ .  
 F, Seed cut lengthwise. e, endosperm; c, cotyledons; r, radicle.  
 (After A. Gray.)

spinosum &c. *Browne Hist. Jam.* 244. (Fig. 91.) Type in *Herb. Linn.*

Prickly Poppy, Gamboge Thistle, Mexican Thistle.  
 In fl. throughout the year; *Barham* (7697 in fr. coll. *Sloane*)! *Browne*;  
*Kingston*, *Clute*! *Spanish Town*; *Hope*; *Harris*! *Fl. Jam.* 6760, 6979,  
 8456.—West Indies, tropical continental America, and widely naturalised.  
 Herb 1½-3 ft. high. Leaves 8-20 cm. l. Flowers with 2 or 3 leafy  
 bracts. Sepals (incl. spiny apex) about 2 cm. l. Petals yellow or  
 orange-coloured, 2-2.5 cm. l. Capsule rounded at both ends, 4-6-valved,  
 2.5-3.5 cm. l.; style very short. Seeds globose, reticulate-pitted, about  
 2 mm. l.

## 2. BOCCONIA L.

Herbs or shrubs with dark yellow juice. Panicles terminal,  
 much branched. Sepals 2. Petals none. Stamens 8-24.  
 Placentas of the ovary 2; ovule solitary, erect from the base;  
 stigmas 2, spreading. Capsule opening by 2 valves from the

base, leaving the replum persistent. Seed covered obliquely with a soft pulpy aril at the base; endosperm fleshy.

Species 5, natives of tropical America (including West Indies).

**B. frutescens** L. *Sp. Pl.* 505 (1753); *Lam. Encyc. i.* 432 & *Ill. t.* 394; *Descourt. Fl. Ant. i. t.* 54; *Macf. Jam.* 22; *Griseb. Fl. Br. W. Ind.* 13; *Urb. Symb. Ant.* iv. 250; *Fedde in Engl. Pflanzenreich iv. pt.* 104, 216 (*f. 27, s, t*), 218. *B. racemosa* &c.

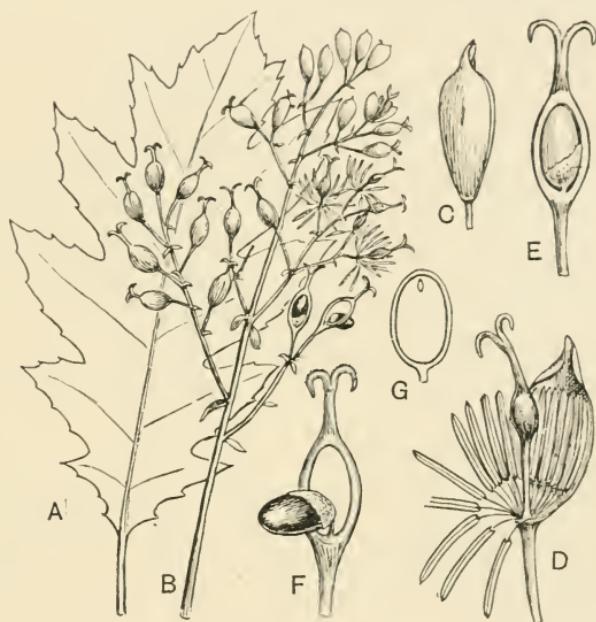


Fig. 92.—*Bocconia frutescens* L.

A, Leaf  $\times \frac{1}{4}$ .

B, Portion of inflorescence  $\times \frac{3}{4}$ .

C, Flower-bud  $\times 2$ .

D, Flower just opening with one sepal removed  $\times 2$ .

E, Fruit with one valve gone; note oblique aril enveloping base of seed  $\times 2$ .

F, Fruit with both valves gone  $\times 2$ .

G, Seed cut lengthwise  $\times 2$ .

*Plum. Nov. Pl. Amer. Gen.* 35, *t.* 25; *Trew Pl. Select.* *t.* 4. *Chelidonium majus* arboreum &c. *Sloane Cat.* 82 & *Hist. i.* 196, *t.* 125. *Bocconia ramosa* &c. *Browne Hist. Jam.* 244. Type in *Herb. Mus. Brit.* (Fig. 92.)

John Crow Bush, Parrot Weed, Celandine.

In fl. Oct.-Jan.; *Houstoun* (9094 in fr. coll. *Sloane*)! *Sloane Herb.* iii. 114! *Browne*; *Broughton*! common in the interior, *Macfadyen*! *Distin*! *St. Mary*, *McNab*! *Purdie*! *March*! common on the Blue Mountains, *Moore*! *Bryce*!—Cuba, Hispaniola, Porto Rico, St. Kitts, Guadeloupe, Dominica, Martinique, St. Vincent, tropical continental America from Mexico to Peru.

*Shrub* 3-10 ft. high. *Leaves*, outline oblong-elliptical, base wedge-shaped, pinnatifid, lobes subentire, sparingly denticulate, upper leaves on the inflorescence entire, oblong or elliptical, repand or denticulate, on upper surface glabrous, young leaves densely tomentose beneath, but older leaves only tomentose along the nerves and puberulous on the veins, 1-2 dm. l.; petioles 1.5-3 cm. l., tomentose, more or less glabrescent. *Panicles* 2.5-4 dm. l. *Sepals* 6-8 mm. l. *Stamens* nearly equalling the sepals; anthers 4-5 mm. l. *Style* protruding, about 2 mm. l., stigmatic branches longer, revolute.

The juice of the root is acrid and bitter, and has been used in cases of chronic ophthalmia, and for warts and ring-worm. "The root scraped and beat up into a pulp is an excellent application to foul ulcers" (Macfadyen).

### FAMILY XXXI. CAPPARIDACEÆ.

Annual herbs, shrubs or trees, with watery juice. Leaves alternate, simple or digitately compound. Stipules often present. Flowers hermaphrodite, regular or irregular. Sepals 4, free or more or less united. Petals 4. Stamens numerous, or, if few, not tetrodynamous. Ovary stalked, rarely sessile, 1-celled or several-celled, with numerous campylotropous ovules on parietal placentas. Fruit a 2-valved many-seeded capsule or a berry. Seed with curved embryo; endosperm wanting.

Species 450, dispersed through tropical and subtropical regions.

Herbs (sometimes shrubby). Fruit a capsule.

Stamens free.

Stamens 4-6.....	1. <i>Cleome</i> .
Stamens 8-30.....	2. <i>Polanisia</i> .

Stamens attached to the gynophore .....

3. *Gynandropsis*.

Trees or shrubs. Fruit a berry.

Leaves simple .....	4. <i>Capparis</i> .
Leaves 3-foliolate .....	5. <i>Cratæva</i> .

#### 1. CLEOME L.

Herbs or somewhat shrubby plants. Leaves simple or 3-7-foliolate. Calyx with 4 teeth or lobes, or sepals 4, free. Petals sessile or clawed. Receptacle short. Stamens 4-6. Fruit a capsule. Seeds kidney-shaped.

Species 70, in subtropical and tropical regions, specially numerous in America, Arabia and Egypt.

Leaves compound.

Stipular prickles 2. Leaflets 5-7.

Gynophore much longer than the pedicel..... 1. *C. spinosa*.

Gynophore much shorter than the pedicel..... 2. *C. Houstounii*.

Without prickles. Leaflets 3.

Leaflets quite glabrous. Gynophore wanting

or very short..... 3. *C. serrata*.

[Leaflets minutely or obsoletely ciliolate. Gyno-

phore 5-1 cm. l..... 4. *C. ciliata*.]

Leaves simple, small..... 4. *C. procumbens*.

1. *C. spinosa* Jacq. *Enum. Pl. Carib.* 26 (1760); pubescent, often glandular; stipular prickles two at base of petiole, deciduous prickles sometimes on petiole; leaflets 7 or 5 (or 3 in the highest and lowest); bracts broadly ovate to roundish, subcordate, sessile or subsessile; stigma sessile even in the fruit, scarcely dilated; capsule longer than (sometimes twice as long as) the gynophore, which is generally longer than (sometimes twice as long as) the pedicel—Jacq. *Sel. Stirp. Amer.* 190; *L. Sp. Pl. ed. 2*, 939; *Bot. Mag. t.* 1640; *Eichl. in Fl. Bras. xiii. pt. 1*, 252 (forms pungens

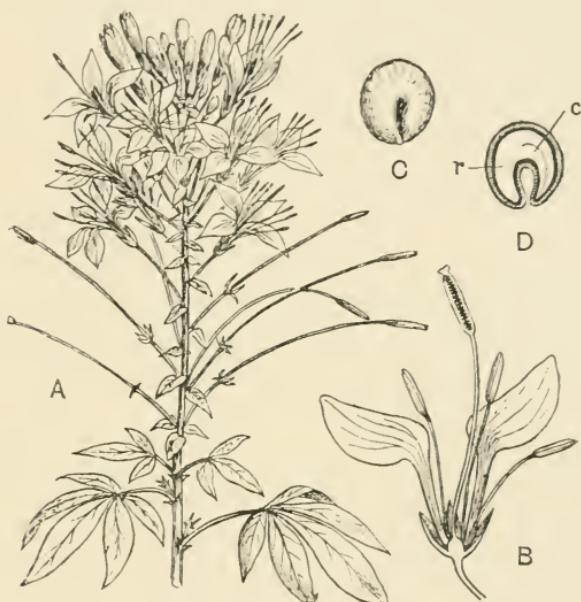


Fig. 93.—*Cleome spinosa* Jacq.

A, Portion of flowering branch  $\times \frac{1}{2}$ .  
B, Flower cut lengthwise, slightly enlarged.

C, Seed  $\times 5$ .  
D, Seed cut lengthwise  $\times 5$ ; c, cotyledons; r, radicle. (After Baillon.)

and spinosa); *Sprague in Gard. Chron.* 1909, pt. 1, 114; *Urb. Symb. Ant.* iv. 251. C. heptaphylla *L. Sp. Pl. ed. 2*, 937 (1763) (so far as concerns reference to *Mill. Dict.*); *Sw. Obs. Bot.* 252. C. Erucago *Mill. Dict. ed. 8* (1768) (specimen from Houstoun in *Herb. Mus. Brit.*). C. pungens *Willd. Enum. Hort. Berol.* 689 (1809) & *Hort. Berol.* 18, t. 18; *Griseb. Fl. Br. W. Ind.* 15. *Sinapistrum* *Ægyptium heptaphyllum* &c. *Sloane Cat.* 80 & *Hist. i.* 194. C. assurgens &c. *Browne Hist. Jam.* 273. (Fig. 93.) Specimen from Jacquin in *Herb. Mus. Brit.*

St. Jago de la Vega, *Sloane*; *Houstoun*! Kingston, *Broughton*! St. Mary, *Purdie*! *Prior*! King's House Grounds, J.P. 1349, *Morris*! *Annotto Bay*, *Thompson*! Kingston; Port Antonio; Lucea; *Hitchcock*;

Lacovia, *Harris!* Fl. Jam. 7913, 9849.—West Indies, tropical and subtropical America.

*Herb* 3-5 ft. high. *Leaflets* lanceolate to broadly lanceolate, 3-9 cm. l.; petioles 2-11 cm. l. *Racemes* 1-4 dm. l. *Flowers* white or pale rose (rarely purple), sometimes trimorphic on the same plant, about 2 cm. l. (excl. stamens); pedicels 2-3 cm. l. *Petals*, claw nearly as long as limb. *Stamens* 6, crimson, generally long exserted. *Ovary* much shorter than its stalk, the gynophore, in the flower. *Capsule* linear-cylindrical, 5-9 cm. l. *Seeds* nearly 2 mm. in diam.

Var. *horrida* var. *nov.* pubescent-glandular, sometimes glabrescent; deciduous prickles also at base of lower bracts, few or many prickles on petioles and middle nerve of leaf; leaflets 5; bracts elliptical to lanceolate, base roundish, obtuse or acute, shortly stalked; capsule often shorter than the gynophore, and much longer than the pedicel.—*C. horrida* *Mart. ex Schult. Syst. vii.* 32 (1829). *C. spinosa* form *horrida* *Eichl. tom. cit.* 253 (1865).

Troy, 1500 ft., *Harris!* Fl. Jam. 8547.—S. United States, Brazil, Bolivia.

2. *C. Houstounii R. Br. (Houstonii) in Ait. Hort. Kew. ed. 2, iv. 131 (1812)*; glandular-pubescent; stipular prickles at base of petiole and bracts, and prickles also on petiole; leaflets 5-3; bracts ovate or oblong, cordate, sessile; style short but increasing in length in the fruit; stigma much dilated; gynophore in fruit very short, much shorter than the pedicel, which is half as long as (or less than) the capsule.—*DC. tom. cit.* 241; *Griseb. op. cit.* 16; *Eichl. tom. cit.* 256. *Sinapistrum indicum spinosum* &c. *Houst. Cat. MS.* 203 [215] & in *Martyn Hist.* 45, t. 43 (1737).

St. Jago de la Vega, *Sloane Herb.* iii. 108\*! Houstoun is stated by De Candolle and Grisebach to have collected this species in Jamaica, but his plants in *Herb. Mus. Brit.* are from Havana, and the coloured drawing by himself in *Martyn's Historia* is of a specimen also from Cuba.

*Herb* 3-5 ft. high. *Leaflets* lanceolate to broadly lanceolate, 3-9 cm. l.; petioles 2-9 cm. l. *Racemes* 1-2.5 dm. l. *Flowers* rose-coloured or purplish, 1-1.5 cm. l.; pedicels 1.5-2.5 cm. l. in fl., to 3.5 cm. l. in fr. *Petals*, claw much shorter than limb. *Stamens* 6, red, not as long as the petals. *Ovary* longer than the gynophore in the flower, and soon very much longer. *Capsule* linear-cylindrical, 5-9 cm. l. *Seeds* 1.5 mm. in diam., muriculate on back.

[*C. ciliata* *Schum. & Thonn. in Dan. Vid. Selsk. Afh. iv.* 68 (1829); sparsely pilose or subglabrous; leaflets 3 (rarely 5), minutely or obsoletely ciliolate; capsule with prominent nerves, several times longer than the short gynophore, and much longer than, to more than twice as long as, the pedicel.—*Oliver Fl. Trop. Afr. i.* 78. *C. guineensis* *Hook. f. in Hook. Niger Fl.* 218 (1849).

Spontaneous in Hope Grounds; Hope Mines; *Harris!* Fl. Jam. 5638, 6551, 6639.—Tropical Africa.

*Herb* erect, or sometimes trailing, 1-3 ft. high. *Leaves* long-stalked

below to sessile at apex, variable in size, 9-24 mm. l. (in Jamaican specimens); leaflets rhomboid-elliptical to lanceolate. *Flowers* white-lilac, 5-7 mm. l., buds purplish. *Stamens* 6. *Capsule* linear-cylindrical, 2.5-6 cm. l.; *gynophore* 5-1 cm. l.]

3. *C. serrata* Jacq. *Enum. Pl. Carib.* 26 (1760); glabrous, without prickles; leaflets 3 (or 1 only near the base); capsule sessile or with a very short gynophore, 4 or 5 times as long as the pedicel.—*Jacq. Sel. Stirp. Amer.* 190, *t.* 180, *f.* 43. *C. polygama* L. *Sp. Pl. ed. 2*, 939 (1763); *Griseb. loc. cit.*; *Eichl. tom. cit.* 257. *Sinapistrum indicum triphyllum* &c. *Sloane Cat.* 80 & *Hist. i.* 194, *t.* 124, *f.* 1. *Cleome erectum triphyllum* &c. *Browne Hist. Jam.* 273. Specimen from Jacquin in *Herb. Mus. Brit.* Type of *C. polygama* L. in *Herb. Linn.* from Browne.

Banks of R. Cobre and Guanaboa, *Sloane Herb.* iii. 109! *Browne!* *Wright!* *Robins!* *Masson!* *Distin!* St. Mary; Mam mee Bay, St. Ann; Dawkins, St. Catherine; *McNab!* *Wilson!* *Metcalfe!* Port Antonio, *Hitchcock!* Hope Grounds, *Fawcett!* Hope; Bath; *Harris!* Fl. Jam. 5178, 6623, 8300.—Cuba, S. Mexico, Panama.

*Herb* 2 ft. high. *Leaflets* lanceolate or narrowly elliptical, acuminate, minutely serrate, 3-12 cm. l. *Petioles* 2-5 cm. l. *Racemes* in fruit 1-3 dm. l. *Bracts* minute, awl-shaped, deciduous. *Flowers* white or pale rose, about 1 cm. l.; pedicels 1.2-1.5 cm. l. *Petals*, claw much shorter than limb. *Stamens* 6, about as long as the petals. *Ovary* sessile. *Capsule* 5-7 cm. l., linear-cylindrical, sessile or very shortly stalked.

4. *C. procumbens* Jacq. *Sel. Stirp. Amer.* 189, *t.* 120 & *Ed pict.* *t.* 181; leaves all simple, linear-lanceolate; capsule sessile or with a very short gynophore, twice to three times as long as the pedicel.—*Sw. Obs. Bot.* 253; *Griseb. loc. cit.*; *Eichl. tom. cit.* 259. *C. Sloanei* Urb. *Symb. Ant. v.* 347. *Leucoium luteum* &c. *Sloane Cat.* 49 & *Hist. i.* 193, *t.* 123, *f.* 1. Specimen from Jacquin in *Herb. Mus. Brit.*

Spanish Town, *Sloane Herb.* iii. 107! Old Harbour, *Broughton!* *Masson!* *Swartz!* *Distin!* Liguanea Plain, *McNab!* *March!* Hope Grounds, *Fawcett!* near Black River, *Harris!* Spanish Town, *Harris & Britton!* Fl. Jam. 8301, 9966, 10,518.—Cuba, Hispaniola (*Jacquin!*).

Herbaceous plant, woody below, glabrous, without prickles, 4-12 in. high. *Root* woody, perennial, 5-10 cm. l. *Branches* procumbent, ascending, and erect. *Leaves* 1-2 cm. l., shortly stalked. *Flowers* yellow, white, or rosy, axillary on the branches above, about 5 mm. l. *Capsule* linear-cylindrical, apiculate with the persistent style (2-3 mm. l.) 14-25 mm. l.

## 2. POLANISIA Rafin.

Annual herbs. Leaves simple or 3-9-foliate, the upper bract-like. Sepals free or united at the base, deciduous. Petals sessile or clawed, imbricate. Receptacle small. Stamens 8-30, hypogynous, bent downward in bud. Capsules long, sessile or stalked.

Species 14, natives of tropics and subtropics, one (*P. viscosa*) found throughout the tropics.

*P. viscosa* DC. *Prodr. i.* 242 (1824). *P. icosandra* Wight & Arn. *Prodr. 22* (1834); *Wight Icon. t. 2*. *Cleome viscosa* L. *Sp. Pl.* 672 (1753); *Hook. f. & Thoms. Fl. Br. Ind. i.* 170. *C. icosandra* L. *Sp. Pl.* 672 (1753); *Willd. Sp. Pl. 2* 100 (1797); *DC. Prodr. 22* (1834); *Wight Icon. t. 2*.

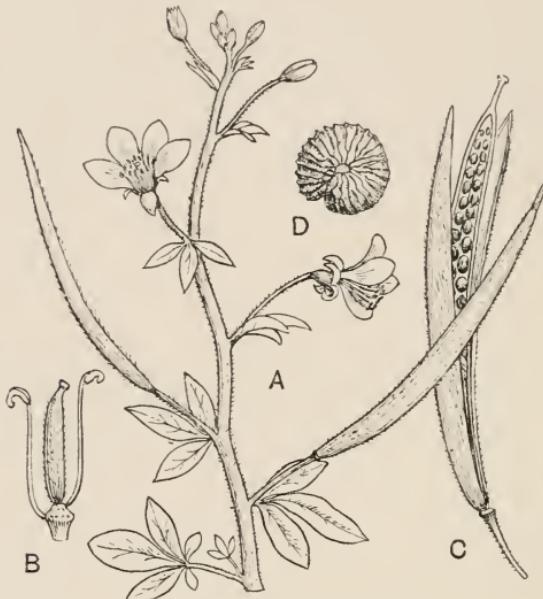


Fig. 94.—*Polanisia viscosa* DC.

A, Portion of flowering branch, nat. B, Flower with sepals, petals and most of the stamens removed  $\times 2$ . C, Ripe fruit, nat. size.

*sandra* L. *loc. cit.* *Sinapistrum zeylanicum* &c. *Martyn Hist. 23, t. 25.* (Fig. 94.) Type in *Hermann's Herb. in Herb. Mus. Brit.*

Mouth of Hope River, *McNab!* *Wilson!* *Gordon Town, Ball!* *Kingston;* Constant Spring; *Hitchcock;* Spanish Town; Bath; *Harris!* *Liguanea Plain, Thompson!* *Fl. Jam.* 6823, 8071.—Bermuda, Cuba, St. Thomas, Guadeloupe, Dominica, Martinique, St. Vincent.

Plant 1-3 ft. high, pubescent with simple and glandular hairs. Leaves 3-5-foliolate; leaflets oblanceolate or narrowly elliptical, equaling or shorter than the petiole, upper with shorter petioles to subsessile. Flowers yellow, solitary in the axils of the upper leaves. Petals obovate, about 1 cm. l. Stamens 12-20. Capsule 6-8 cm. l., striate, narrowed to the apex, glandular-pubescent. Seeds about 2 mm. in diam., round, flattened, shell-like, with raised transverse lines.

## 3. GYNANDROPSIS DC.

Annual herbs. Leaves 3-7-foliate. Racemes leafy. Sepals spreading, deciduous. Petals obovate, clawed, imbricate or open. Receptacle hemispherical at the base, and produced in the middle into a stalk-like process (gynophore) to which the filaments of the six stamens are united. Filaments free above. Ovary stalked. Fruit a stalked elongated capsule.

Species about 10, natives of the tropics.

Bracts 3-foliate. Petals about 1 cm. l. .... 1. *G. pentaphylla*.  
Bracts simple. Petals 2·5-3 cm. l. .... 2. *G. speciosa*.

1. *G. pentaphylla* DC. *Prodr. i.* 238 (1824); leaves 5 (the lowest leaves with 3); bracts 3-foliate; petals about 1 cm. l.—

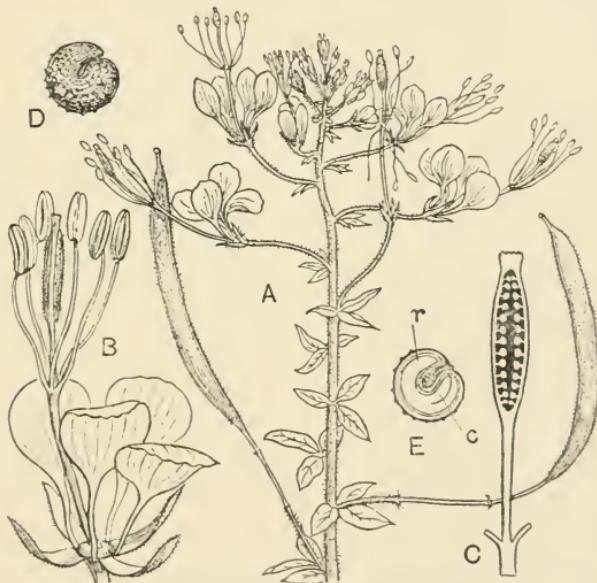


Fig. 95.—*Gynandropsis pentaphylla* DC.

A, Portion of flowering branch  $\times \frac{1}{2}$ .  
B, Flower  $\times 3$ .  
C, Ovary cut lengthwise  $\times 4$ .

D, Seed  $\times 7$ .  
E, Ditto, cut lengthwise  $\times 7$ .  
(After A. Gray.)

A. Gr. Gen. 180 t. 78; Eichl. in *Fl. Bras.* xiii. pt. 1, 261, t. 58, f. III.; Urb. *Symb. Ant.* iv. 252. Cleome pentaphylla L. Sp. Pl. ed. 2, 938 (1763); Jacq. *Hort. Vindob.* t. 24; *Bot. Mag.* 1681; Griseb. *Fl. Br. W. Ind.* 15. Sinapistrum indicum pentaphyllum &c. Sloane Cat. 80 & *Hist. i.* 194. Gynandropsis palmipes DC. loc. cit. (1824); Deless. *Ic. Sel. iii.* t. 1. (Fig. 95.) Type in Herb. Linn.

Passage Fort, Sloane Herb. iii. 108 (2, 3)! Broughton! Distin! Prior; March.—West Indies and tropical and subtropical America. Native probably in Africa and Asia.

*Herb* erect, more or less glandular-pubescent, 1-3 ft. high. *Leaflets* obovate, sometimes elliptical, acute or obtuse, entire or minutely dentate, 2-5 cm. l. *Flowers* white or purplish. *Sepals* about 5 cm. l. *Petals* not imbricate in bud. *Capsule* cylindrical 4.5-5 cm. l.; gynophore 2-3 cm. l. (the upper part about half as long as the lower); pedicel about 2 cm. l. *Seeds* about 1.2 mm. in diam., rugose-muriculate.

2. *G. speciosa* DC. *Prodr. i.* 238 (1824); leaflets 7 (5); bracts simple, cordate; petals 2.5-3 cm. l.—*Urb. Symb. Ant. iv.* 252. *Cleome speciosa* H.B. & K. *Nov. Gen. v.* 84, *t. 436* (1821); *Griseb. loc. cit.*

*Arcadia*, Mrs. *Sewell*!—Guadeloupe, Martinique, continental America from Mexico to Ecuador.

*Leaflets* narrowly elliptical to lanceolate, 7-14 cm. l. *Sepals* about 3 mm. l. *Petals* imbricate in bud. *Capsule* linear-cylindrical, about 8 cm. l.; gynophore 5-6 cm. l. (the upper part about 7 times as long as the lower); pedicel about 2.5 cm. l.

#### 4. CAPPARIS L.\*

Trees or shrubs, without prickles in American species. Leaves simple, more or less leathery; stipules, when present (as in *C. baducca* and *C. flexuosa*), generally confined to young or barren shoots. Flowers pedicellate, corymbose. Calyx 4-lobed or -partite, or sepals 4, free; the West Indian species have 4 glands at the base of the calyx, each opposite a sepal. Petals 4, imbricate. Stamens many, but few (about 8) in *C. ferruginea*. Ovary with a stalk (gynophore), 1-4-celled; placentas generally 2. Fruit a subglobose, elongated or siliquiform berry, with pulpy pericarp, indehiscent or rupturing irregularly or splitting into 3 or 4 valves, but without a replum; the gynophore often lengthened. Seeds numerous or few, embedded in the pulp, globose-kidney-shaped, without endosperm. Embryo convolute; cotyledons foliaceous, fleshy.

Species 150, natives of warmer regions, with greatest development in the number of species in Central and South America.

Plant mostly covered with minute scales.

Bud 4-angled with the edges of the valvate sepals 1. *C. cynophallophora*.  
Bud with open sepals.

Leaves narrowly oblong-elliptical ..... 2. *C. indica*.  
Leaves long, linear-lanceolate ..... 3. *C. longifolia*.<sup>+</sup>

Plant mostly covered with stellate hairs ..... 4. *C. ferruginea*.

Plant glabrous and without scales.

Stamens not longer than the petals ..... 5. *C. baducca*.  
Stamens much longer than the petals ..... 6. *C. flexuosa*.

\* See *Journal of Botany*, lii. 142 (1914), for notes on the nomenclature of the Jamaican species.

<sup>+</sup> Provisionally placed here, but flowers not seen; easily recognised by the very long narrow scaly leaves.

1. *C. cynophallophora* L. *Sp. Pl.* 504 (1753), *Hort. Cliff.* 204 (1737), *Syst. ed.* 10, 1071 (1759) (excl. syn. *Plum.*) & *Sp. Pl.* ed. 2, 721 (1762) (excl. syn. *Plum.*, *Pluk.*, & *Sloan.*) ; plant mostly covered with minute scales ; leaves elliptical or oblong-elliptical, or narrowly elliptical ; flower-bud 4-angled ; sepals distinct, in one series, valvate, nearly as long as the petals, reflexed : stamens two or three times as long as the petals ; fruit siliquiform, torulose, dry, rupturing irregularly.—*C. siliquosa* L. *Syst. ed.* 10, 1071 (1759) (excl. syn. *Pluk.*). *C. jamaicensis* Jacq. *Enum. Pl.*

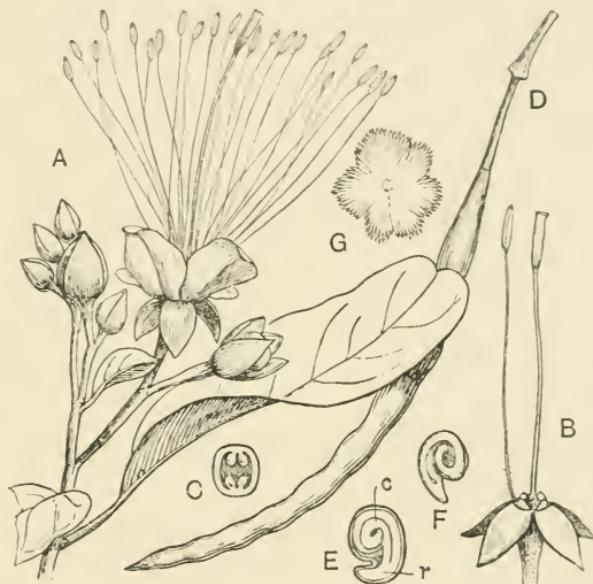


Fig. 96.—*Capparis cynophallophora* L.

A, Portion of flowering branch  $\times \frac{2}{3}$ .  
 B, Flower with petals and stamens (except one) removed  $\times \frac{2}{3}$ .  
 C, Ovary cut across  $\times 5$ .  
 D, Fruit  $\times \frac{3}{2}$ .  
 E, Seed cut lengthwise, slightly enlarged ; c, cotyledon ; r, radicle.  
 F, Embryo slightly enlarged.  
 G, Scale very much enlarged.  
 (After Sargent.)

*Carib.* 23 (1760) ; *Sel. Stirp. Amer.* 160, t. 101 & *Ed. pict.* 78, t. 150 ; *Macf. Jam.* i. 39 ; *Griseb. Fl. Br. W. Ind.* 18 ; *Eichl. in Fl. Bras.* xiii. pt. 1, 270, t. 64, f. II. ; *Sarg. Silv.* i. 33, t. 19 ; *Urb. Symb. Ant.* iv. 252. *C. torulosa* Sw. *Prodr.* 81 (1788) & *Fl. Ind. Occ.* 932 ; *Macf. Jam.* i. 40. *C. Breynia* Sw. *Obs.* 210 (1791) ; *Macf. loc. cit.* ; (non L. nec *Jacq.*). *C. emarginata* A. *Rich. in Sagra Cub.* x. 28, t. 9 (1845). *Breynia fruticosa* foliis oblongis, &c. *Browne Hist. Jam.* 246, t. 27, f. 1 (excl. syn.). *B. arborescens* &c. *Browne loc. cit.* (excl. syn.). (Fig. 96.) Specimen from *Hortus Cliffortianus* in *Herb. Mus. Brit.*

Black Willow, Zebra Wood (Wright).

In fl. and fr. May-Sept. ; Wright ! Shakspear ! Bancroft ! Road from

Spanish Town to Old Harbour, *Macfadyen*! *McNab*! St. Mary, *Purdie*! Bath, *Wilson*! *March*! *Prior*! Westphalia, J.P. 1418, *Hart*! Constant Spring; Spanish Town Road; *Campbell*! Sheldon; Robertsfield; near Troy, 1200 ft.; Cane River Valley, 300 ft.; Potsdam, 2600 ft.; *Harris*! Fl. Jam. 5718, 7713, 9488, 9630, 9816.—Florida and Keys, Bahamas, West Indies, Costa Rica, Mexico, Panama, Margarita, Venezuela.

Small slender tree or shrub, 6-30 ft. high. Leaves glabrous on the upper surface, scaly beneath; nerves and veins indistinct above, nerves sometimes prominent beneath, veins obsolete; 4-12 cm. l., 2-6 cm. br.; petiole 1-3 cm. l. Flowers fragrant. Sepals 8-11 mm. l. Petals white changing to purplish, scaly outside, glabrous within, 10-13 mm. l. Stamens 20-30, purplish with yellow anthers. Ovary with the gynophore about as long as the stamens. Fruit to 3 dm. and more, varying in length and in its proportion to the gynophore (1.5-5 cm. l.) sometimes as much as 10 times as long.

2. *C. indica* *Fawc.* & *Rendle* in *Journ. Bot. lii.* 143, 4 (1914); plant mostly covered with minute scales; leaves narrowly oblong-elliptical or sometimes narrowly elliptical; calyx small, deeply cleft; segments subulate or lanceolate, open in bud; stamens nearly twice as long as the petals; fruit siliquiform, somewhat torulose, dry, 2-valved, showing the scarlet pulp.—*C. Breynia* *L. Syst. ed. 10*, 1071 (1759); *Jacq. Sel. Stirp. Amer.* 161, *t.* 103 & *Ed. pict.* 78, *t.* 152; *Eichl. tom. cit.* 271, *t.* 64, *f.* III.; *Urb. tom. cit.* 253 (non *Sw.*). *C. amygdalifolia* *Jacq. Enum. Pl. Carib.* 24 (1760). *C. amygdalina* *Lam. Encyc. i.* 608 (1785); *Griseb. tom. cit.* 17 (excl. syn. *Br. Jam.* *t.* 27, *f.* 2). *Breynia indica* *L. Sp. Pl.* 503 (1753). *Ceratonia affinis* *arbor siliquosa* &c. *Sloane Cat.* 153 & *Hist. ii.* 60. *Salix arbor folliculifera* &c. *Pluk. Alm.* 328, *t.* 221, *f.* 1. *Breynia amygdali foliis* &c. *Plum. Nov. Pl. Amer. Gen.* 40. *B. elaeagni* *foliis* *Plum. loc. cit. t.* 16; *Breyn. Icon.* 13, *cum. t.*

#### White Willow.

In fl. Apr., May; in fr. July, Aug.; Savannas, St. Jago de la Vega and woods between the town and Passage Fort, *Sloane* *Herb. vi.* 54! *Wright*! *Swartz*! *Arnott*!—Porto Rico, St. Thomas, St. Cruz, St. Jan, St. Bartholomew, Antigua, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Mustique, Barbados, Central America, Panama, Colombia, Venezuela.

Shrub or tree 8-25 ft. high. Leaves glabrous on the upper side, scaly beneath, 7-10 (5-11) cm. l., 2-3.5 (-4.5) cm. br.; petiole about 1 cm. l. Flowers near the top of the branches, very fragrant. Sepals 2-3 mm. l. Petals white, elliptical, tomentose on the inside, scaly-tomentose outside, 1-1.2 cm. l. Stamens about 16. Ovary spuriously 2-celled, with the long gynophore longer than the stamens. Fruit 6-25 cm. l.

A specimen from Mutis, probably from Colombia, in the Linnean Herbarium is named *C. Breynia* in Linnæus's writing. The fruits are very short 2-4.5 cm. l., with a very short gynophore, about 2 mm. l.

3. *C. longifolia* *Sw. Prodr.* 81 (1788); plant mostly covered with minute scales; leaves linear-lanceolate, 10-15 times longer than broad; fruit siliquiform, rupturing irregularly.—*Sw. Fl. Ind. Occ.* 934; *Macf. Jam. i.* 40; *Eichl. loc. cit.* *Salix folliculifera*

longissimis argenteis et acutis foliis *Pluk. Alm.* 328, *t.* 327, *f.* 6. Specimen from Plukenet in fruit in *Sloane Herb. ci.* 168.

“Habitat in locis apricis maritimisque Jamaicæ,” Swartz (loc. cit.)—St. Thomas, Antigua, Barbados.

Leaves, apex very acute, glabrous and shining on the upper surface, scaly beneath, midrib immersed on upper surface and very prominent beneath, nerves and veins obsolete above and faintly indicated beneath, 13–20 cm. l., 1·8–2 cm. br.; petiole 7–1 cm. l. Fruit very long, cylindrical-nodulose, three times as long as the gynophore, measuring with the gynophore about 20 cm. l., 5 cm. in diam.

4. *C. ferruginea* L. *Syst. ed.* 10, 1071 (1759) (excl. ref. to Browne), plant mostly covered with stellate hairs; calyx small, deeply cleft, segments subulate or lanceolate, open in bud; stamens usually 8, about as long as the petals; fruit small, subglobose, 2 or 3 times as long as the gynophore (4–5 mm. l.)—*L. Amæn. v.* 398 & *Sp. Pl. ed.* 2, 721; *Sw. Ob.* 208; *Macf. Jam. i.* 38; *Griseb. op. cit.* 17; *Eichl. tom. cit.* 274. *C. elæagnifolia* *Jacq. Enum. Pl. Carib.* 23 (1760). *C. octandra* *Jacq. Sel. Stirp. Amer.* 160 *t.* 100 (1763) & *Ed. pict. t.* 149. *Breynia fruticosa* foliis singularibus &c. *Browne Hist. Jam.* 246 (excl. *t.* 27, *f.* 2). *Cratæva fruticosa* foliis singularibus &c. *Browne Hist. Jam.* 247, *t.* 28, *f.* 1. There is a specimen from Browne in *Herb. Linn.* with name “*ferruginea*” in Solander’s writing.

#### Mustard Shrub.

In fl. March–May (Sept.); in fr. Jan., Apr., June, Sept.; common near Kingston and in all the lowlands, *Browne!* *Wright!* *Broughton!* *Shakspear!* Rockfort; Ocho Rios; *McNab!* Windward Road, Kingston, *Wilson!* *Prior!* March! Lime Cay; Waterhouse Pen, 250 ft.; *Campbell!* Cane River valley, 300 ft.; near Wareka, 100 ft.; Yardley Chase, 1600 ft.; Pedro Bluff; *Negril!* *Harris!* Fl. *Jam.* 5800, 6043, 8607, 9624, 9668, 9725, 10,227.—Hispaniola (fide Jacquin).

Shrub or tree to 25 ft. high. Leaves oblong-lanceolate, oblong-ob lanceolate or sometimes narrowly elliptical, glabrous above, powdery-pubescent with stellate down beneath, 5–10 (3-) cm. l., 1–3·5 (–4) cm. br.; petioles 5–1·5 cm. l. Flowers small, odourless but sometimes slightly fragrant, near the top of branches. Calyx 2–2·5 mm. l. Petals white, sometimes purplish, elliptical, about 5 cm. l. Fruit to nearly 1·5 cm. l., dehiscent. Seeds few, compressed.

The plant has a pungent smell and taste, whence the common name.

5. *C. baducea* L. *Sp. Pl.* 504 (1753); plant glabrous, without scales; leaves large, somewhat clustered at intervals, elliptical-oblong, sometimes somewhat obovate, base minutely cordate, stipulate; calyx 4-lobed, small (2 mm. l.), lobes imbricate; stamens as long as the petals; fruit short, oblong, irregularly nodose-torose, 5 to 10 times as long as the gynophore (5–8 mm. l.).—*C. frondosa* *Jacq. Enum. Pl. Carib.* 24 (1760); *Sel. Stirp. Amer.* 162, *t.* 104 & *Ed. pict. t.* 153; *Griseb. op. cit.* 19; *Eichl. tom. cit.* 280 (in part); *Urb. tom. cit.* 253. Specimen from Hortus Cliffortianus in *Herb. Mus. Brit.*

In fl. Feb., April, May; in fr. Feb., Aug., Sept., Nov.; Hopewell, St. Ann, McNab! Ocho Rios, Purdie!—West Indies, Central America, Panama, Colombia, Venezuela, Guiana.

Shrub or small tree, 7-25 ft. high. Leaves, nerves and veins prominent beneath, evident above, 1-3 dm. l., 3-5-10 cm. br.; petioles 5-5 cm. l. Flowers odourless, corymbose at the end of branches. Calyx-lobes roundish, barely 1.5 mm. l., glands small. Petals pale greenish-white or purplish, obovate, very fugacious, 8 mm. l. Stamens white, pink at base, numerous. Fruit 3-6 cm. l., purplish-brown.

6. *C. flexuosa* L. *Sp. Pl. ed. 2*, 722 (1762); plant glabrous, without scales; leaves oblong-elliptical to elliptical, but also very variable in breadth from broadly elliptical to almost linear, with an oblong axillary gland, stipulate; calyx 4-partite, segments in two series, imbricate, roundish, concave, one-third as long as the petals; stamens about three times as long as the petals; fruit siliquiform, continuous or torulose, about twice as long as the gynophore (4-9 cm. l).—*C. cynophallophora* L. *Syst. ed. 10*, 1071 (1759) (with ref. to Plumier) & *Sp. Pl. ed. 2*, 721 (in part) (non *Sp. Pl. 504*); *Jacq. Sel. Stirp. Amer. 158 t. 98* & *Ed. pict. t. 145*; *Wright Mem. 195*; *Macf. Jam. i. 37*; *Griseb. loc. cit. (excl.  $\beta$ )*; *Eichl. tom. cit. 282, t. 63*; *Urb. tom. cit. 254*. *Morisonia flexuosa* L. *Amoen. v. 398* (1760). *Acaciis affinis arbor siliquosa* &c. *Sloane Cat. 153* & *Hist. ii. 59*. *Capparis arborescens lauri foliis fructu longissimo* *Plum. Cat. 7, Pl. Amer. (Burm.) t. 73, f. 1* & *Ic. ined. ii. 36*. *Cynophallophorus* &c. *Pluk. Alm. 126, t. 172, f. 4* (specimen in Herb. Sloane xvi. 2). Type in Herb. Linn.

#### Bottle-cod Root.

In fl. after the rains in May and Oct.; St. Jago de la Vega, *Sloane Herb. vi. 52*; *Houstoun*! *Browne*! *Broughton*! *Wright*! *Shakspear*! *Swartz*! common on the plains, *Macfadyen*; St. Andrew; St. Mary; *Distin*! *McNab*! Morant Bay, *Wilson*! Hope River, *Armstrong*! Cherry Garden; King's House; Mavis Bank; J.P. 1350, *Morris*! Stony Hill; Red Hills; Up Park Camp; *Campbell*! Hope, *Harris*! Fl. Jam. 5692, 5922, 6523, 6635.—Florida, Cuba, Cayman, Hispaniola, Porto Rico, St. Thomas, St. Cruz, St. Bartholomew, St. Eustatius, Antigua, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Mustique, Bequia, Barbados, Panama, S. America.

Shrub or tree 8-25 ft. high. Leaves, nerves and veins more or less prominent on both sides, 4-9 cm. l., 1-4.5 cm. br.; petiole about 5 cm. l. Racemes axillary and terminal. Flowers showy, fragrant. Sepals, the outer smaller than the inner, 5-7 mm. l. Petals white or pale rose, obovate, about 1.5 cm. l. Stamens white, to nearly 5 cm. l. Fruit 7-15 cm. l., 1-1.5 cm. in diam., opening gradually by rupture by two valves from the apex either on one side or on both. Seeds many in two rows, imbedded in the scarlet pulp.

Var. *saligna* comb. nov., leaves long, linear to linear-lanceolate, 9-12 cm. l., .5 to nearly 2 cm. br.—*C. saligna* *Vahl Symb. iii. 66* (1794). *C. cynophallophora* var. *saligna* *Griseb. loc. cit.*

*Masson*! Palisadoes, J.P., 1006, *Morris*!—St. Cruz.

## 5. CRATÆVA L.

Glabrous trees or shrubs, the twigs marked with lenticels. Leaves 3-foliolate. Flowers purpurascent, many in a corymbose raceme, often polygamous, tasting like horse-radish. Sepals 4, persistent. Petals 4, white, with a long claw, open in bud, two somewhat larger; claw nearly as long as limb. Receptacle saucer-shaped with inverted lobed margin from which the sepals and petals spring, elevated or produced into a cylinder in the centre from which arise the stamens and pistil. Stamens 8–30, long exserted. Pistil with a long stalk (gynophore), as long as the stamens; ovary 1–2-celled; placentas 2. Berry globose or ovoid, 1–2-celled. Seeds kidney-shaped; cotyledons subcylindrical, convolute. The whole plant smells of garlic, whence the common name, Garlic Pear tree.

Species 10, natives of the tropics.

Petals elliptical above, 1·6–2·4 cm. l., 4–7 mm. br.

Fruit 3·2–3·8 cm. in diam..... 1. *C. Tapia*.

Petals narrowly elliptical-oblong, 1·8–1·7 cm. l., 1–2 mm.

br. Fruit about 2 cm. in diam..... 2. *C. gynandra*.

1. *C. Tapia* L. *Sp. Pl.* 444 (1753); petals, limb elliptical with a long claw, 1·6–2·4 cm. l., 4–7 mm. br.; receptacle only

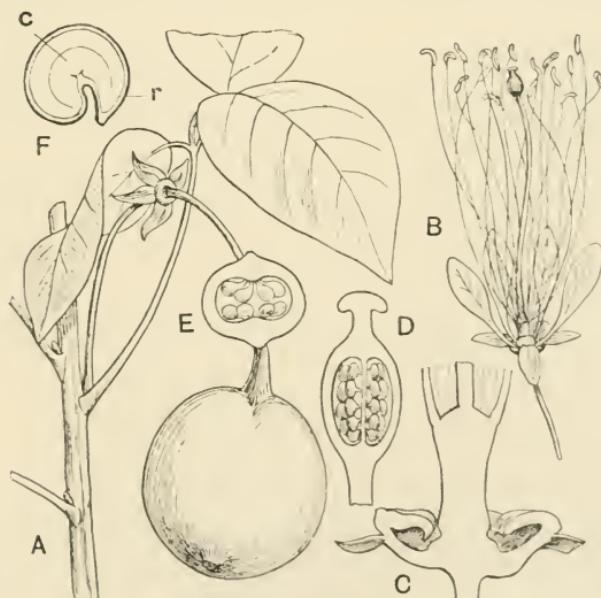


Fig. 97.—*Cratæva Tapia* L.

A, Portion of branch showing leaf and fruit  $\times \frac{1}{2}$ .

D, Ovary cut lengthwise  $\times 5$ .

B, Flower  $\times \frac{2}{3}$ .

E, Ovary cut across  $\times 6$ .

C, Receptacle cut lengthwise  $\times 5$ .

F, Seed cut lengthwise  $\times 1\frac{1}{2}$ ; c, cotyledons; r, radicle. (After Eichler.)

slightly elevated in the centre; berry globose, 3·2–3·8 cm. in diam.—*Macf. Jam. i. 37*; *Griseb. Fl. Br. W. Ind. 17*; *Eichl. in Fl. Bras. xiii. pt. 1, 264, t. 59*. *C. arborea* foliis crassis &c. *Browne Hist. Jam. 247*. *Tapia Piso Bras. 68* & *woodcut* & *Maregr. Hist. 98* & *woodcut*. *Malus americana* trifolia &c. *Commel. Amst. i. 129*, t. 67. *Tapia arborea* triphylla *Plum. Nov. Pl. Amer. Gen. 22*, t. 21. (Fig. 97.)

In fl. May; in fr. June–Aug.; Spanish Town road; Salt Ponds; *Macfadyen!* Ferry River; near Bull Bay; *Harris!* Fl. Jam. 8272, 9569.—Central and tropical S. America.

Tree about 20 ft. high. Leaves, leaflets elliptical or broadly elliptical, shortly acuminate, base rounded, obtuse or wedge-shaped, lateral oblique and with unequal sides, membranous, becoming thicker, often somewhat leathery, in fruit, 5–13 cm. l., 3–7 cm. br.; petiolule short, 5–13 mm. l.; common petiole 2 cm. l. near the flowers, and as long as 13 cm. lower. Sepals oblong, slightly constricted below, 5–7 mm. l., 1·5–2·5 mm. br. Stamens 5–6 cm. l. Gynophore of berry 3·5–6 cm. l.; pedicel 3–5 cm. l. Berry “size of a small orange” (Macfadyen). Seeds 8 mm. in diam.

2. *C. gynandra* *L. Sp. Pl. ed. 2, 636 (1762)*; petals, limb oblong or narrowly elliptical-oblong, 8–1·7 cm. l., 1–2 mm. br.; receptacle generally elevated in the centre, 2–4 mm. l.; berry ovoid, somewhat more than 2 cm. in diam.—*Macf. Jam. i. 36*; *Griseb. loc. cit.* *Anona trifolia* flore stamineo &c. *Sloane Cat. 205* & *Hist. ii. 169*. *Cratæva arborea* foliis ovatis &c. *Browne Hist. Jam. 246*.

In fl. March, Apr.; in fr. June; *Sloane Herb. vii. 100!* *Wright!* *Swartz!* common in the plains, *Macfadyen*; Hopewell, St. Mary, *McNab!* Spring Garden, Buff Bay, J.P. 1474, *Morris!* Annotto Bay, *Thompson!* Fl. Jam. 7917.—Central and tropical S. America.

Tree 15–20 ft. high. Leaves, leaflets elliptical, shortly acuminate, terminal with base wedge-shaped, lateral unequal-sided with oblique base, membranous becoming chartaceous, 5–15 cm. l., 2·5–6·5 cm. br.; petiolule 4–8 mm. l.; common petiole 3–9 cm. l. Sepals oblong, more or less contracted below, 3–5 mm. l. Stamens 2·5–4·5 cm. l. Berry “size of a pigeon’s egg” (Macfadyen).

Sloane’s description of the fruit as “perfectly spherical, of the bigness of a tennis ball,” evidently refers to the preceding species, which he does not distinguish from this.

## FAMILY XXXII. CRUCIFERÆ.

Herbs, annual or perennial, with watery juice. Leaves simple, alternate; in many species the radical leaves are runcinate, and the caudine auriculate at the base. Stipules wanting. Flowers in racemes, often corymbose, generally terminal, hermaphrodite. Sepals 4, free, the lateral often saccate at the base. Petals 4, spreading in a cruciate manner. Stamens 6, of which 4 are long and 2 short (tetradynamous),

some of which are sometimes abortive (only 2-4 in *Lepidium*, 4 in *Cardamine hirsuta*). Ovary of 2 carpels, 1-celled with 1 or 2 parietal placentas, or rarely one basilar. Fruit a narrow 2-valved capsule with 2 parietal placentas, from which the valves separate in dehiscence (*siliqua*) ; if the length does not more than twice or thrice surpass the breadth, the fruit is called a *silicula* ; usually a false partition is stretched across between the two placentas, rendering the pod 2-celled. In *Coronopus* the silicula is indehiscent. In *Cakile* the fruit is indehiscent and transversely 2-jointed. Embryo without endosperm. Cotyledons folded so that the back of one is laid against the radicle (*incubent o||*), or their edges are longitudinally applied to the radicle (*accumbent o==*), or they are folded together lengthwise (*coaduplicate o»*).

Species 1900, dispersed over the whole earth, but chiefly in temperate and frigid zones of the northern hemisphere.

Fruit a siliqua.

Seeds in two rows..... 1. *Nasturtium*.

Seeds in one row.

Valves flat, separating elastically and curved back on themselves from the base..... 2. *Cardamine*.

Valves convex, not separating elastically.

[Siliquas adpressed to rhachis, awl-shaped..... *Sisymbrium*.]

[Siliquas spreading, lanceolate or broadly linear.... *Brassica*.]

Fruit a silicula.

Silicula dehiscing by valves.

Silicula obcordate-triangular. Seeds many ..... 3. *Capsella*.

Silicula compressed-orbicular. Seeds one in each cell 4. *Lepidium*.

Silicula indehiscent, minute, 1.35 mm. l., didymous.... 5. *Coronopus*.

Fruit transversely 2-jointed. Plant fleshy..... 6. *Cakile*.

A. Fruit a siliqua with the partition as broad as the valve.

### 1. NASTURTIUM Br.

Branching herbs. Leaves pinnately lobed, pinnatisect or entire. Flowers small, white or yellow. Stamens 6 (or 1-6). Siliqua narrow, valves turgid ; septum hyaline. Seeds small, turgid, in two rows ; cotyledons accumbent.

Species 50, found almost all over the world.

**N. fontanum** Aschers. *Fl. Prov. Brandeub.* 32 (1864) ; *O. E. Schulz in Urb. Symb. Ant.* iii. 513 ; *Urb. Symb. Aut.* iv. 257. **N. officinale** R. Br. in *Ait. Hort. Kew.* ed. 2, iv. 110 (1812) ; *Macf. Jam.* i. 24 ; *Griseb. Fl. Br. W. Ind.* 13. *Cardamine fontana* Lam. *Encyc.* ii. 185 (1786). *Sisymbrium Nasturtium-aquaticum* L. *Sp. Pl.* 657 (1753). *N. aquaticum vulgare* *Sloane Cat.* 79 & *Hist.* i. 193. *Sisymbrium aquaticum* &c. *Browne Hist. Jam.* 272. (Fig. 98.) Type in *Herb. Linn.*

## Water Cress.

In fl. April-May; in perennial rivulets; *Sloane*; *Ferry* and other places, *Browne*; *Macfadyen*; *Mavis Bank, Johnson!*—Bermuda, Cuba, Porto Rico, St. Thomas, St. Cruz, Dominica, Martinique, St. Vincent, throughout the whole world.

Perennial aquatic. Stem decumbent below, rooting at the nodes, erect above,  $\frac{1}{2}$ -2 ft. (and more). Leaves pinnate, lower 5-10 cm. l., leaflets

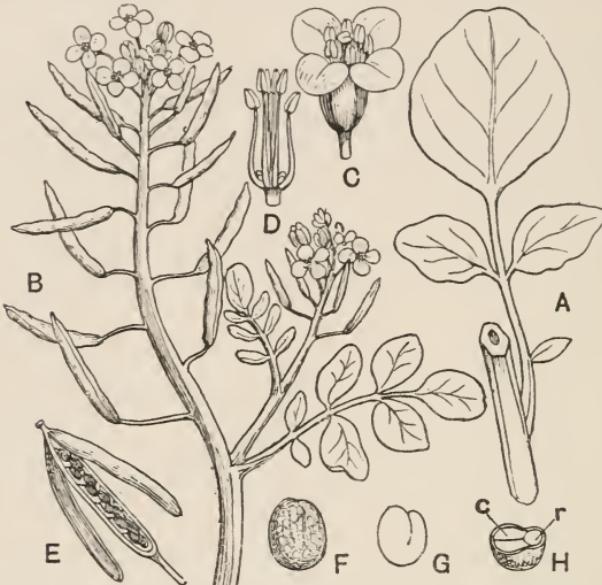


Fig. 98.—*Nasturtium fontanum* Aschers.

A, Leaf from base of plant $\times \frac{2}{3}$ .	F, Seed $\times 8$ .
B, Upper portion of flowering branch $\times \frac{2}{3}$ .	G, Embryo $\times 8$ .
C, Flower $\times 4$ .	H, Seed cut across $\times 8$ . c, cotyledons;
D, Stamens and receptacle $\times 4$ .	r, radicle.
E, Siliqua slightly enlarged.	

1-5 pairs, terminal leaflet broadest and largest, roundish, 1-3.5 cm. in diam. Flowers 3.5-4 mm. l. Sepals 2 mm. l. Petals white. Disk-glands 4. Siliqua 6-1.5 cm. l. Seed about 1 mm. l.

*N. heterophyllum* Blume, *Bijdr.* 50 (1825), is a weed in Castleton Gardens, but we do not know of its occurrence elsewhere in the island. The leaves are denticulate, obovate or rhomboid, sublyrate, the lower stalked, the highest sessile; the flowers are greenish-yellow, petals wanting; the siliquas are somewhat terete, elongate, strict.

## 2. CARDAMINE L.

Leaves generally pinnatisect. Flowers purple or white. Sepals equal at base. Petals clawed or narrowed to base. Siliqua linear, compressed, valves flat, nerveless, separating

elastically. Seeds in one row, compressed; cotyledons accumbent. *Lady's Smock.*

Species 120, natives of temperate, alpine and frigid regions of the world.

**C. hirsuta** L. *Sp. Pl.* 655 (1753); *Griseb. Fl. Br. W. Ind.* 13; *O. E. Schulz in Urb. Symb. Ant.* iii. 520 & in *Engl. Bot. Jahrb.*

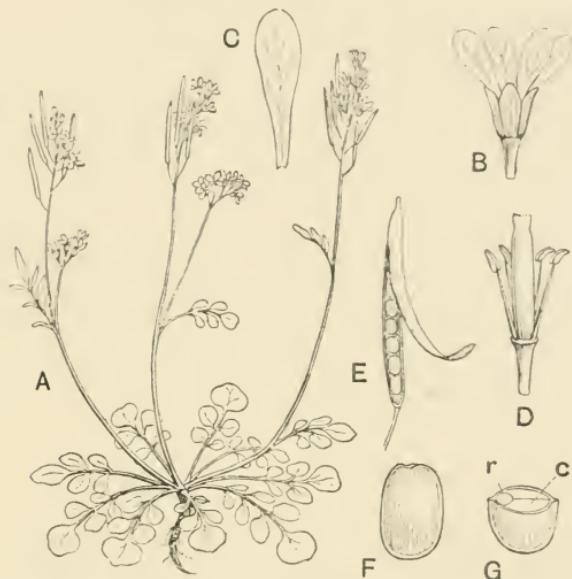


Fig. 99.—*Cardamine hirsuta* L.

A, Plant  $\times \frac{2}{3}$ .

B, Flower  $\times 4$ .

C, Petal  $\times 6$ .

D, Pistil and stamens  $\times 5$ .

E, Siliqua slightly enlarged.

F, Seed  $\times 10$ .

G, Ditto cut across  $\times 10$ ; c, cotyledon; r, radicle.

*xxii. 464. C. sylvatica* Macf. *Jam. i.* 25 (1837) (non Link). (Fig. 99.) Type in *Herb. Linn.*

In fl. Dec.-March; Port Royal and St. David's Mts., *Macfadyen*; Quashie Hill, 5560 ft.,  *Eggers*; Cinchona, 4900 ft.; Hardware Gap, 4000 ft.; *Harris!* Fl. *Jam.* 9204, 10,110, 11,696.—Widely distributed in the northern hemisphere.

Annual. Stem erect,  $\frac{1}{2}$ -1 ft. high. Leaves imparipinnate, radical numerous, 5-8 cm. l., few on the stem, 2-4 cm. l.; leaflets 1-4 paired, stalked, terminal largest, roundish, with a few hairs on the upper surface and at the base of the petiole. Pedicels of flowers 1.5-2 mm. l., of siliques 5-1.5 cm. l. Sepals greenish-hyaline, 1.5 mm. l. Petals white, 4, sometimes only 2 or more, about 3 mm. l. Stamens usually 4, 2 mm. l. Style none. Siliqua about 2 cm. l., 1 mm. br. Seeds about 1 mm. l.

The sepals of this species are described by O. E. Schulz as "dorso parce pilosa," but in the dried specimens examined the sepals are glabrous.

[**SISYMBRIUM** L.]

Radical leaves spreading, cauline often auriculate-amplexicaul. Flowers generally yellow or white. Sepals equal or subsaccate at base. Petals often narrow and long clawed. Siliqua awl-shaped-linear, adpressed to the rhachis. Seeds generally many, in one row; cotyledons incumbent. *Hedg e-m u s t a r d.*

Species 50, mostly natives of Europe, Siberia and western Asia as far as India, a few of temperate and subarctic N. America, and a very few of the northern hemisphere.

*S. officinale* *Scop. Fl. Carniol. ed. 2, ii. 26 (1772); Macf. Jam. i. 27; Griseb. Fl. Br. W. Ind. 13; Eichl. in Fl. Bras. xiii. pt. 1, 303; Britton in Torreya vi. 31.* *Erysimum officinale L. Sp. Pl. 660 (1753).* Type in *Herb. Linn.*

In fl. throughout the year; "not uncommon in Port Royal Mts." *Macfadyen; Hart!*—Bermuda, Hispaniola. Native of Europe. Naturalised in N. America and West Indies.

Annual plant, more or less hairy with recurved hairs. Stem 1 to 2 ft. high, with branches spreading more or less at right angles. Leaves runcinate, lower 6–8 cm. l., upper smaller. Raceme very short and crowded in flower, much elongated afterwards. Flowers 2·5–3 mm. l. Sepals 1·5–2 mm. l. Petals yellow. Siliqua 1–1·4 cm. l., at base 1–1·5 mm. br., pungent, erect, closely pressed to the rhachis.]

[**BRASSICA** L.]

Erect herbs, the radical leaves pinnatifid. Racemes long, leafless. Flowers generally yellow. Ovary with 12 to 24 ovules. Siliqua nearly terete, narrowing into the linear beak, spreading away from rhachis; valves convex with one prominent nerve and the 2 lateral flexuose; partition as wide as the valves. Seeds in one row, subglobose. Cotyledons conduplicate.

Species about 50, natives of the Mediterranean Region, and of central Europe and of central and east Asia.

*B. integrifolia* *O. E. Schulz in Urb. Symb. Ant. iii. 509 (1903).*  
*B. lanceolata* *Lange Fl. Danica fasc. xlv. 7, t. 2658 (1861).*  
*B. juncea* *Hitchc. in Rep. Miss. Bot. Gard. 1893, 58 (non Coss.); Kew Bull. 1893, 236.* *Sinapis integrifolia* *West Bidr. Ste Croix 296 (1793); Willd. Hort. Berol. t. 14 (1816).* *S. lanceolata* *DC. Syst. ii. 611 (1821); Macf. Jam. i. 31.* *S. brassicata* *Griseb. Fl. Br. W. Ind. 14 (1859) (non L.).* *Sinapi foliis &c.* *Sloane Cat. 79 & Hist. i. 193, t. 123, f. 2.* Type in *Herb. Mus. Brit.*

## Wild Mustard.

"Cultivated places," *Sloane* *Herb. iii. 108!* common in the Port Royal Mts., *Macfadyen; Lucea, Hitchcock.*—Apparently spontaneous in the West Indies. Native of southern and eastern Asia.

*Stem 1-2½ ft. high. Leaves lower broadly obovate, often with small lobes at the base, coarsely toothed, 8-28 cm. l.; middle oblong, toothed; upper linear-lanceolate, entire, 4-8 cm. l. Flowers 6-9 mm. l. Sepals 4-5 mm. l. Petals light yellow. Siliqua 3-3·5 cm. l., 1·5-2 mm. br.; style slender, 3-6 mm. l.]*

B. Fruit a silicula with the partition very narrow.

### 3. CAPSELLA Medik.

Branching herbs. Radical leaves rosulate. Flowers small, white, in terminal and axillary racemes, with the petals sometimes changed into stamens. Sepals equal at base. Silicula laterally compressed, valves boat-shaped, keeled. Seeds many, in two rows; cotyledons incumbent. Shepherd's Purse.

Species 5, natives of temperate regions and of mountains in the tropics.

**C. Bursa-pastoris** Moench. *Method.* 271 (1794); *Macf. Jam.* i. 27; *Griseb. Fl. Br. W. Ind.* 14. *Thlaspi Bursa-pastoris* L. *Sp. Pl.* 647 (1753). (Fig. 100.) Type in *Herb. Linn.*

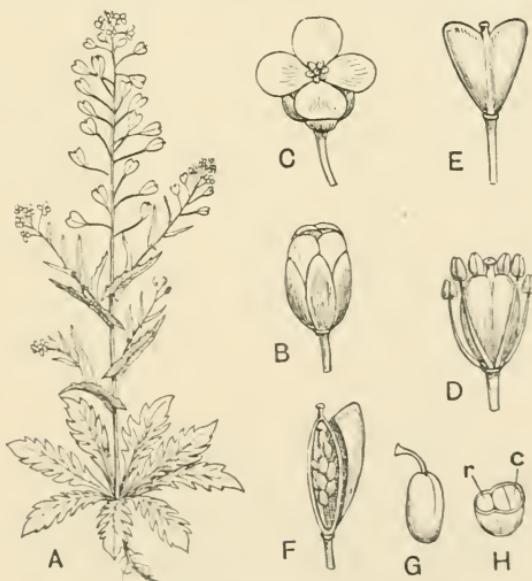


Fig. 100.—*Capsella Bursa-pastoris* Moench.

A, Plant  $\times \frac{1}{2}$ .

B, Bud  $\times 6$ .

C, Flower  $\times 6$ .

D, Pistil and stamens  $\times 12$ .

E, Silicula  $\times 2$ .

F, Silicula with one valve removed  $\times 2$ .

G, Seed  $\times 8$ .

H, Ditto cut across  $\times 8$ ; c, Cotyledon;

r, radicle.

(After Sturm.)

In fl. all the year; waste places and coffee fields in the mountains, *Macfadyen*.—A weed of cultivation, found in temperate regions and in mountains in the tropics.

Annual. Stem  $\frac{1}{2}$ - $1\frac{1}{2}$  ft. high. Leaves, radical generally pinnatifid, 3-12 cm. l.; upper sagittate, clasping, lanceolate, 2-3 cm. l.; acute, toothed, with stellate and simple hairs. Flowers 2.5 mm. in diam. Silicula obcordate-triangular, 6-8 mm. l. Seeds 10-20, about 1 mm. l.

#### 4. LEPIDIUM L.

Erect herbs. Flowers small, white. Sepals short, equal at base. Petals equal, entire, spatulate or obovate. Stamens 6, slightly tetrodynamous, or only 2. Ovary sessile, 2-celled; ovules solitary in the cells. Silicula compressed-orbicular. Seed in each cell, pendulous from near the summit. Cotyledons incumbent, rarely accumbent as in *L. virginicum*. Pepperwort. Peppergrass.

Species 122, widely dispersed in the temperate and warm regions of the world.

Petals scarcely longer than the sepals. Silicula 3 mm. l.... *L. virginicum*.  
[Petals half as long again as the sepals. Silicula 6 mm. l. *L. sativum*.]

*L. virginicum* L. *Sp. Pl.* 645 (1753); leaves mostly simple; petals scarcely longer than the sepals; stamens 2; silicula 3-

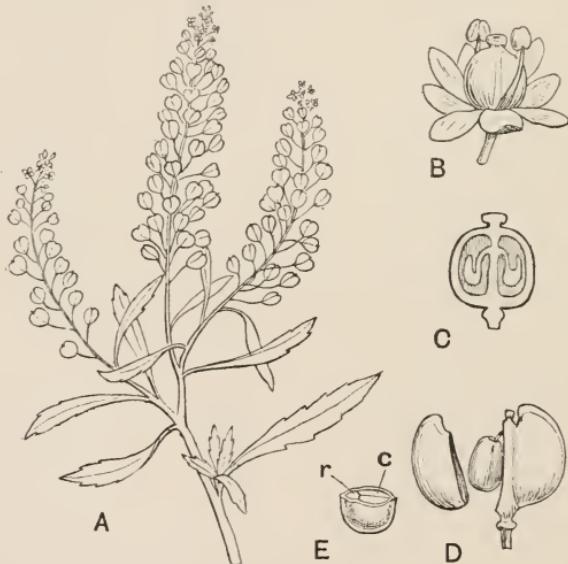


Fig. 101.—*Lepidium virginicum* L.

A, Upper portion of branch  $\times \frac{2}{3}$ .

B, Flower  $\times 10$ .

C, Ovary cut lengthwise  $\times 10$ .

D, Silicula  $\times 4$ .

E, Seed cut across  $\times 6$ .  
(After A. Gray.)

3.5 mm. l.; fruiting pedicels spreading.—*Wright Mem.* 283; *A. Gr. Gen.* 167, *t.* 73, *f.* 1-7; *Griseb. Fl. Br. W. Ind.* 14;

Hitchc. in Rep. Miss. Bot. Gard. 58; O. E. Schulz in Urb. Symb. Ant. iii. 494; Urb. Symb. Ant. iv. 255; Thell. Monogr. 222; Descourt. Fl. Ant. i. 193, t. 41. *Iberis humilior annua* &c. Sloane Cat. 80 & Hist. i. 195, t. 123, f. 3. *Lepidium erectum* &c. Browne Hist. Jam. 272. (Fig. 101.) Original specimens from Hortus Cliffortianus & in Herb. Gronovius in Herb. Mus. Brit.

In fl. all the year; "in most of the inland places," Sloane Herb. iii. 110! Houstoun! Wright! Prior; Morris! hills near Kingston, Hansen; Gordon Town, Eggers; also Ball! Resource, 3600 ft., Harris! Fl. Jam. 6914; Porus, C. G. Lloyd; Blue Mts., Rothrock.—Bermuda, Bahamas, Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, St. Jan, St. Bartholomew, St. Eustatius, Nevis, Antigua, Guadeloupe, Martinique, St. Vincent, Barbados, Tobago, N. America, from Canada to Texas; introduced into Europe.

Stem 1-1½ ft. high. Leaves mostly oblanceolate or linear, serrate, the lowest often deeply cut or even pinnate, the highest minutely serrate or entire, lowest 4-10 cm. l., middle 2-4 cm. l. Pedicel, flowering 2-5-3 mm. l., fruiting 4-5 mm. l. Flowers about 1 mm. l. Silicula narrowly winged at the apex. Seeds about 2 mm. l., 1 mm. br. Cotyledons accumbent.

"Supplies the place of cress in salads" (Sloane).

[*L. sativum* L. Sp. Pl. 644 (1753); leaves mostly pinnate or deeply cut; petals half as long again as the sepals; stamens 6; silicula about 6 mm. l.; fruiting pedicels erect.—Macf. Jam. i. 29; Griseb. loc. cit.; O. E. Schulz tom. cit. 496; Thell. Monogr. 121; Descourt. tom. cit. t. 42. Type in Herb. Linn.

Macfadyen.—S. W. Asia and N. E. Africa, now cultivated and spontaneous all over the world.

Stem ½-2 ft. high. Leaves, lower 3-8 cm. l., upper 3-4 cm. l. Pedicels flowering 1-1.5 mm. l., fruiting 2-3 mm. l. Flowers 1.5-2 mm. l. Silicula broadly winged, especially near the apex. Cotyledons incumbent. "It is a favourite salad, and has the reputation of being antiscorbutic and antiphthisical" (Macfadyen).]

## 5. CORONOPUS Gaertn.

Herbs much branched from the base, diffuse. Leaves mostly pinnatifid. Racemes short, opposite the leaves. Flowers very small, white. Sepals short, equal at the base. Petals entire or wanting. Stamens 6 and tetrodynamous, or 4 (the shorter abortive), or 2. Silicula didymous, broader than long, valves sub-globose, indehiscent. Seeds solitary in each cell. Cotyledons long, linear, curved back above their base, thus appearing like 4 in transverse section. Wart-cress.

Species 12, natives mostly of subtropical, also of temperate regions.

*C. didymus* J. E. Smith *Fl. Brit.* ii. 691 (1800); *O. E. Schulz* in *Urb. Symb. Ant.* iii. 496; *Muschler* in *Engl. Bot. Jahrb.* xl. 134. *Lepidium didymum* L. *Mant.* 92 (1767). *Senebiera pinnatifida* DC. in *Mém. Soc. Hist. Nat. Par.* 144, t. 9 (1799); *Macf. Jam.*

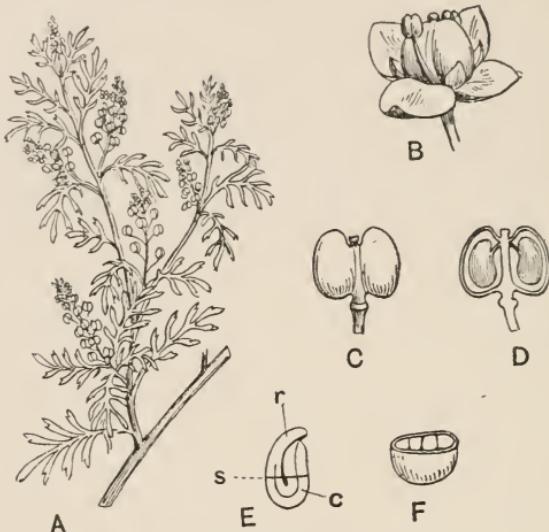


Fig. 102.—*Coronopus didymus* J. E. Smith.

A, Portion of branch  $\times \frac{1}{2}$ .

E, Embryo  $\times 30$ ; c, cotyledons; r, radicle.

B, Flower  $\times 16$ .

F, Seed cut across where the line s is drawn in E  $\times 30$ .

C, Silicula  $\times 16$ .

D, Ditto cut lengthwise  $\times 16$ .

i. 28; *Griseb. Fl. Br. W. Ind.* 14; *A. Gr. Gen.* 166, t. 72. (Fig. 102.) Type in *Herb. Linn.*

In fl. throughout the year; "common in Port Royal and St. Andrews Mountains," *Macfadyen*; *Cinchona*, 5000 ft., J.P. 1268, *Hart!* also *Harris!* *Fl. Jam.* 8579.—America from Patagonia to Canada, also widely distributed in Africa, Australia and Europe.

Stems spreading on the ground, 2 to 15 in. l. Leaves pinnatifid, lobes linear, generally entire, sometimes serrate or lobed. Raceme with 25-35 flowers, in fruit 2-3.5 cm. l. Sepals .5 mm. l., oblong, hairy. Petals very short, linear-awl-shaped, or none. Stamens generally only two. Silicula emarginate at the apex, not quite 1.5 mm. l., rather over 2 mm. in diam.; valves wrinkled, but not crested, readily separating.

"The early leaves which are radical, and much larger than those of the stem, afford when young an excellent salad, much superior to those of the garden cress, which they resemble in taste" (*Macfadyen*).

C. Fruit transversely 2-jointed.

#### 6. CAKILE Gaertn.

Fleshy, branching, glabrous herbs. Flowers white or pale purple. Lateral sepals gibbous at base. Siliqua transversely

2-jointed, indehiscent, the lower joint 1-celled, with 1 pendulous seed, the upper 1-celled, with 1 seed erect from the base; cotyledons accumbent.

Species 4, natives of the shores of Europe, N. America, Mexico and the W. Indies.

**C. lanceolata** O. E. Schulz in *Urb. Symb. Ant.* iii. 504 (1903); Britton in *Torreya* vi. 29; subspecies *domingensis* O. E. Schulz *tom. cit.* 505; *Urb. Symb. Ant.* iv. 256; *C. domingensis* Tussac *Fl. Ant.* i. 119 (1808). *C. æqualis* l'Hér. in *DC. Syst.* ii. 430

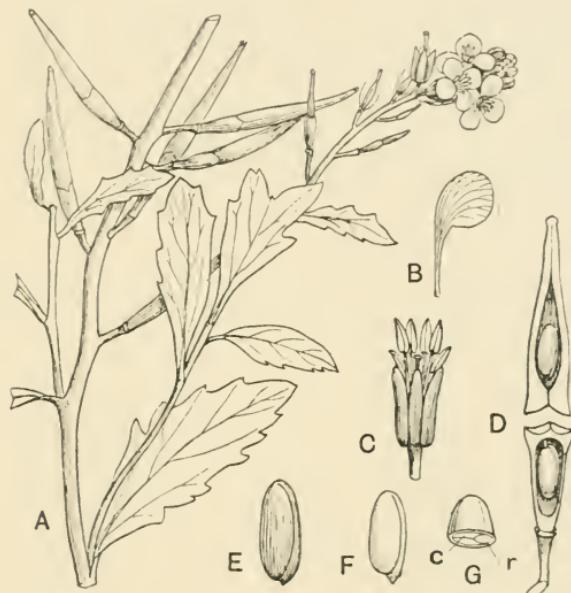


Fig. 103.—*Cakile lanceolata* O. E. Schulz.

A, Portion of plant  $\times \frac{3}{2}$ .

B, Petal  $\times 2$ .

C, Flower without the petals  $\times 2$ .

D, Fruit with the joints separated, slightly enlarged.

E, Seed  $\times 2$ .

F, Embryo  $\times 2$ .

G, Seed cut across  $\times 2$ ; c, cotyledons:

r, radicle.

(A-D after Delessert.)

(1821); *Griseb. Fl. Br. W. Ind.* 14. *C. cubensis* H. B. K. *Nov. Gen. & Sp. v.* 75 (1821). *Raphanus lanceolatus* Willd. *Sp. Pl.* iii. 562 (1801); *Macf. Jam.* i. 32. *Eruca duodecima* *Sloane Cat.* 81 & *Hist.* i. 195. (Fig. 103.)

House Cay near Port Royal, *Sloane Herb.* iii. 111! Plantain Garden River Bay, *Macfadyen!* St. Ann, *McNab!* St. Ann's Bay, *Purdie!* *March!* sea-shore, Healthshire Hills; St. Ann's Bay; *Harris!* *Fl. Jam.* 9521, 10,353, 11,628.—Bermuda, Bahamas, Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, St. Jan, St. Bartholomew, Antigua, Guadeloupe, Désirade, Marie Galante, Martinique, St. Vincent, Barbados, Colombia.

*Stem* erect, 1-5 ft. high. *Leaves* oblanceolate to narrowly oblong

or oblong-linear, entire or toothed, 3-7 cm. l. *Flowers* white, 6-8 mm. l. *Siliqua* 2-3 cm. l., 4 mm. at greatest br.; lower joint obconical-cylindrical, somewhat terete.

### FAMILY XXXIII. TOVARIACEÆ.

Herbs shrubby at base. Stem erect or trailing on shrubs, branching. Leaves 3-foliate, alternate, without stipules. Racemes terminal. Flowers hermaphrodite. Sepals 7 or 8, persistent. Petals 7 or 8, inserted on an elevated disk. Stamens 7 or 8, inserted on the disk; anthers dehiscing longitudinally; filaments flat, linear, apex acute. Ovary subsessile, 6-8-celled; ovules numerous, attached to two spongy axile placentas in each cell; style short or wanting; stigma 5-8-radiate. Berry globose-ovoid. Seeds numerous, minute, buried in the pulp; embryo curved, surrounded by a layer of endosperm.

One genus with 2 or more species, natives of Jamaica, Mexico, Colombia, Ecuador, Venezuela, Peru.

### TOVARIA Ruiz & Pav.

*T. diffusa* comb. nov. *T. pendula* Griseb. *Fl. Br. W. Ind.* 17 (excl. distribution) (non *Ruiz & Pav.*); *Hook. Ic. Pl. t. 664*

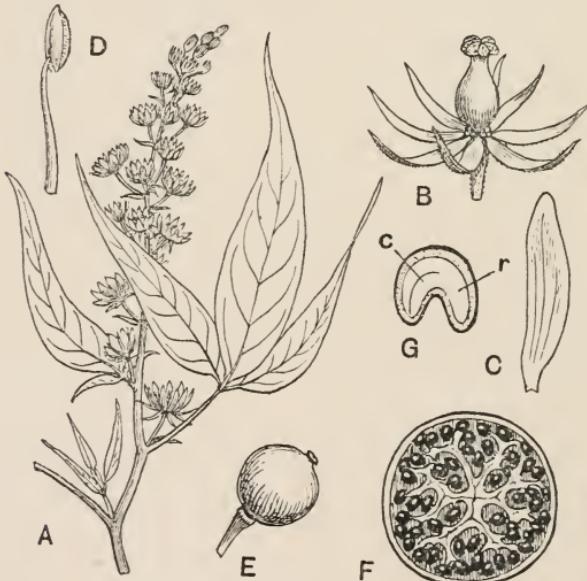


Fig. 104.—*Tovaria diffusa* Fawc. & Rendle.

A, Portion of plant $\times \frac{1}{2}$ .	E, Fruit, nat. size.
B, Flower with petals and stamens re- moved $\times 2$ .	F, Fruit cut across $\times 2$ , showing the branched placentae.
C, Petal $\times 3$ .	G, Seed cut lengthwise $\times 20$ .
D, Stamen $\times 5$ .	(A-E after Hooker.)

(excl. cit. Peru, Caraccas). *Bancroftia diffusa* Macf. *Jam. i.* 112 (1837). (Fig. 104.)

In fl. and fr. Sept. and Oct.; Morce's Gap, and road to Newhaven, St. George, *Macfadyen*; Morce's Gap, *Purdie*! Portland Gap, 5550 ft., *Sullivan*! near Vinegar Hill, 4500 ft. *Harris*!—Mexico, Colombia, Ecuador, Venezuela, Peru.

*Stem* several feet in length, supporting itself on neighbouring shrubs. *Leaflets* lanceolate, acuminate, shortly petiolulate, 6–15 cm. l.; petioles 2–6 cm. l. *Racemes* 15–20 cm. l. *Pedicels* 8–12 mm. l. *Bracteoles* 7–8 mm. l., linear. *Flowers* greenish-white. *Sepals* 8, linear-lanceolate, 4-nerved, nerves giving off branches, minutely ciliolate on margin, 5–6 mm. l. *Petals* 8, linear-oblong to narrowly lanceolate, about 7 mm. l., 3-nerved from base, minutely tomentellous near the base on the inside. *Stamens* 8, shorter than sepals; filaments minutely tomentellous at the base; anthers ovate-sagittate, minutely tomentellous. *Ovary* globose-ellipsoidal on the elevated receptacle, 6-celled; style wanting; stigma dilated, with 6 recurved glandular lobes persistent in fruit. *Berry* 6-celled, 10–11 mm. in diam. *Seed* about 6 mm. in diam.

Differs from *T. pendula* Ruiz & Pav., of which there are excellent type specimens in Herb. Mus. Brit., the flowers of which have ovate sepals, obovate petals much longer than the sepals, and a distinct style which forms a prominent beak in the fruit.

### [FAMILY MORINGACEÆ.]

Trees, the root pungent to the taste and the bark yielding gum. Leaves alternate, 2–3-pinnate with an odd leaflet, pinnae and pinnules opposite, leaflets obovate, entire. Stipules none, but sometimes glands at the base of the petioles and pinnae. Panicles axillary. Flowers showy, hermaphrodite, irregular. Sepals, petals and stamens perigynous at the edge of a cup-shaped receptacle. Sepals 5, unequal, spreading-reflexed, imbricate. Petals 5, like the sepals in shape, the two upper smaller, the lateral ascending, the anterior larger, spreading out. Disk clothing the receptacle with a very short free margin. Stamens 5 perfect, alternating with 5 staminodes. Anthers 1-celled. Ovary 1-celled, with 3 parietal placentas. Style tubular, open at the apex. Ovules numerous, attached in two rows to the placentas. Capsule long, 1-celled, dehiscing by 3 valves, which bear numerous seeds in a single row along the middle of each. Seeds large, 3-winged or without wings. Embryo without endosperm; cotyledons almond-like; plumule many-leaved.

One genus with 3 species, natives of northern Africa, western tropical Asia, and the East Indies, one species (*M. oleifera* Lam.) found throughout the tropics.

## MORINGA Juss.

*M. oleifera* Lam. *Encyc. i.* 398 (1783) & *Ill. t.* 337; *Urb. in Fl. Bras. xii. pt. 1,* 490, *t. 111* & *Symb. Ant. iv.* 257; *Pax in Engl.-Prantl Pflzam. iii. pt. 2,* 243, *fig. 146.* *M. pterygosperma* *Gaertn. Fruct. ii.* 314, *t. 147, f. 2* (1791); *Macf. Jam. i.* 324; *Griseb. Fl. Br. W. Ind.* 16. *M. ben oleifera* *Tussac Fl. Ant. iv.* 46, *t. 16.* *Guilandina Moringa L. Sp. Pl.* 381 (1753); *Descourt. Fl. Ant. i.* 131, *t. 27.*

## Horse-radish Tree.

Introduced by Hinton East in 1784; *Lindsay!* common in sea-side country near Kingston, and eastwards, *Campbell!* *Macfadyen!* *Harris!* *Fl. Jam.* 6454, 7716; *Poros, Lloyd;* Bog Walk, Port Royal, *Hitchcock.*—West Indies and tropics.

Tree 12-20 ft. high. Root thick, soft. Leaves to 5 dm. l. Panicle solitary, axillary. Calyx white, tinged with crimson. Petals white with a yellow tinge, touched with crimson on the outside near the base. Ovary 3-cornered. Capsule 3-cornered. Seeds 3-winged.

The root has the taste of, and forms an excellent substitute for, horse-radish. An excellent palatable oil may be obtained from the seeds, somewhat similar to the oil of ben which is yielded by the wingless seeds of *M. aptera.*]

## FAMILY XXXIV. CRASSULACEÆ.

Herbs, generally fleshy and succulent. Leaves succulent, exstipulate. Flowers hermaphrodite, regular, generally in cymose inflorescences. Calyx free, persistent, 4-lobed in *Bryophyllum*. Petals as many as sepals, free or more or less united. Stamens perigynous, equal to, or double, the number of petals. Carpels as many as the petals, free or united at the base, with a scale at the base of each; stigmas capitellate. Ovules numerous, attached to the ventral suture in two or many rows. Follicles 1-celled, with many or few seeds, dehiscing by the ventral suture. Seeds minute, punctulate; endosperm fleshy, often scanty. Embryo terete, with short cotyledons and long radicle.

Species about 500, chiefly found in the temperate and sub-tropical parts of Europe, western Asia and southern Africa, also many species occur in temperate and tropical N. America, very few in S. America and Australia.

## BRYOPHYLLUM Salisb.

Tall erect fleshy perennial herbs. Leaves opposite, imparipinnate or simple; leaflets 1-5, elliptical, crenate. Flowers large, nodding, in paniculate, many-flowered cymes. Calyx campanulate, inflated, shortly 4-lobed, valvate. Corolla urceo-

late or subcampanulate, shortly 4-lobed. Stamens 8 in two series, inserted on the corolla-tube. Carpels 4. Seeds numerous.

Species 4, natives of tropical Africa, one (*B. pinnatum*) widely dispersed throughout the tropics.

**B. pinnatum** Kurz in *Journ. As. Soc. Beng. xl. pt. 2, 52* (1871); *Urb. Symb. Ant. iv. 258.* *B. calycinum* *Salisb. Parad. Lond. t. 3* (1805); *Griseb. Fl. Br. W. Ind. 303.* *Cotyledon pinnata* *Lam. Encyc. ii. 141* (1786). (Fig. 105.)

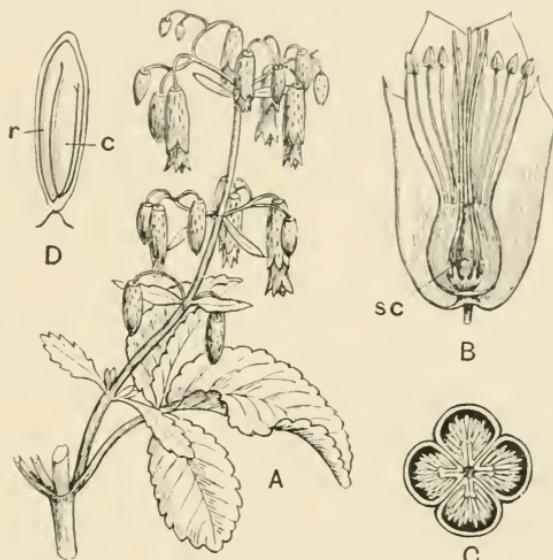


Fig. 105.—*Bryophyllum pinnatum* Kurz.

A, Inflorescence and leaf  $\times \frac{1}{2}$ .

C, Ovary cut across  $\times 3$ .

B, Flower cut lengthwise; sc, scale; nat. D, Seed  $\times 40$ ; c, cotyledon; r, radicle.

*March*; *Blue Mts.*, *Hitchcock*; *Halfway Tree*, *Miss Wood*!—Widely distributed throughout the tropics, presumably a native of Africa.

*Stem* 1-3 ft. high. *Leaves* stalked, uppermost pinnate, lower simple; blade to 13 cm. l., to 7 cm. br. *Calyx*, tube 2·2-3·5 cm. l., lobes 7-1 cm. l. and br. *Corolla*, tube constricted below the middle, 2·5-4·5 cm. l., lobes triangular, very acute, 1-1·5 cm. l., 5-65 cm. br. *Stamens*, filaments free upwards from the constriction below the middle of the corolla-tube. *Carpels* 1·2-1·45 cm. l., passing up into styles 2·5-3 cm. l. *Scales* oblong, 2-2·5 mm. l., 1-1·25 mm. br.

#### FAMILY XXXV. BRUNELLIACEÆ.

Trees. Leaves opposite or 3 in a whorl, simple, 3-foliate or imparipinnate, with very small deciduous stipules. Flowers in corymbiform, axillary and terminal panicles. Flowers rather

small, dioecious or polygamous. Calyx 4-5-partite, valvate, coloured. Corolla none. Disk adnate to the calyx, 8-10-lobed. Male flowers: stamens 8-10, inserted at the base of the disk; ovaries rudimentary. Female or hermaphrodite flowers: carpels 4-5, distinct, 1-celled; styles awl-shaped, with simple stigmas; ovules 2, collateral. Capsules 4 or 5, or fewer by abortion, 2-valved, with 1 or 2 seeds. Seeds with fleshy endosperm; cotyledons flat.

One genus with 10 species, natives of tropical America.

### BRUNELLIA Ruiz & Pav.

*B. comocladifolia* Humb. & Bonpl. *Pl. Équin.* i. 211 t. 59 (1808); Griseb. *Fl. Br. W. Ind.* 139; Urb. in *Engl. Jahrb.* xv. 307 & *Symb. Ant.* iv. 258. *Zanthoxylum Sumach* Macf. *Jam.* i. 195 (1837). (Fig. 106.)

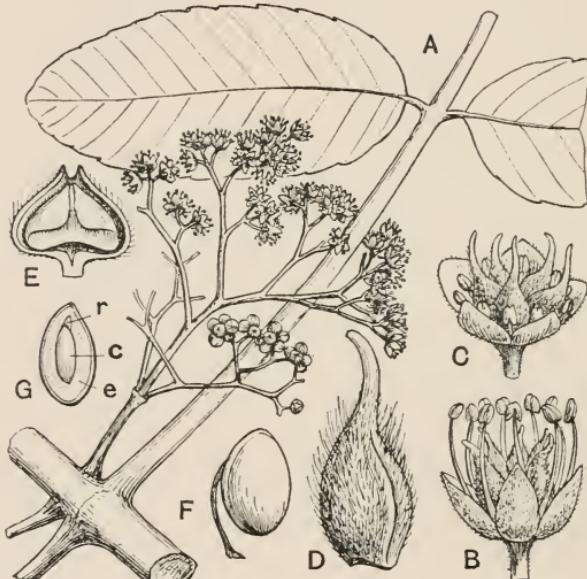


Fig. 106.—*Brunellia comocladifolia* Humb. & Bonpl.

A, Portion of inflorescence and base of leaf  $\times \frac{3}{4}$ .

B, Hermaphrodite flower  $\times 4$ .

C, Female flower  $\times 4$ .

D, Ripe carpel  $\times 7$ .

E, Ripe carpel after dehiscence, empty, showing the exocarp and endocarp  $\times 4$ .

F, Seed  $\times 7$ .

G, Section of seed with testa removed  $\times 7$ ; e, endosperm; c, cotyledon; r, radicle.

#### West Indian Sumach.

Tree about 20 ft. high, young branches and petioles rusty-tomentose. Leaves pinnate, 1.5-3 dm. l.; leaflets in 5-11 pairs with an odd one, oblong-elliptical to oblong-lanceolate, obtuse or subacuminate, serrate-denticulate, pinninerved, glabrous above except the midrib which is puberulous, tomen-

tose beneath, petiolulate, 5-10 cm. l., 2·5-4 cm. br. *Panicles* 6-7 cm. l. *Flowers* numerous, yellow, hermaphrodite and female with apparently more or less functionless anthers. *Calyx* 5-cleft, tomentose, segments 2·5-3 mm. l. *Capsule* about 4 mm. l. *Seeds* about 1·5 mm. l.

Cinchona, J.P. 1271, 1354, Morris!—Cuba, Hispaniola, Porto Rico, Mexico, Colombia, Venezuela, Peru.

### FAMILY XXXVI. CUNONIACEÆ.

Shrubs or trees. Leaves opposite or whorled, stipulate, simple or compound. Flowers small, sometimes polygamous or dioecious. Sepals 4 or 5. Petals as many as, and usually not larger than, the sepals. Stamens twice as many as, rarely as many as, the petals, or sometimes more, inserted under the margin of the disk. Carpels usually 2, united into a 2-celled ovary, or distinct; ovules usually numerous and in two rows on the placenta. Fruit mostly a 2-valved capsule. Seeds several or numerous; embryo small, in the axis of fleshy endosperm; cotyledons flat or convex.

Species 120, natives of temperate and subtropical regions of the southern hemisphere, represented in the northern hemisphere by a few species of *Weinmannia*.

### WEINMANNIA L.

Trees and shrubs. Leaves opposite, imparipinnate (rarely simple); rhachis often winged. Stipules deciduous. Flowers small, white, in clusters (in the Jamaican species), arranged in erect terminal and axillary racemes, hermaphrodite or polygamodioecious. Sepals 4 (rarely 5), imbricate, persistent. Petals inserted under the margin of a perigynous lobed disk, imbricate, caducous. Stamens 8 (rarely 10); filaments exserted, with small anthers. Ovary free, 2-celled, 2-beaked; styles 2, persistent, with simple stigmas; ovules few or many in the cells, in two rows, inserted on the margins of the inflexed carpels. Capsule small, 2-celled, septicidally 2-valved.

Species 70, natives of the West Indies, of tropical and temperate S. America, Australia, New Zealand, Malaya, Madagascar and Polynesia.

*W. pinnata* L. *Syst. ed.* 10, 1005 (1759); *Griseb. Fl. Br. W. Ind.* 303; *Urb. Symb. Ant.* iv. 258; *Britton in N. Amer. Fl.* xxii. pt. 2, 179. *W. hirta* Sw. *Prod. 63* (1788) & *Fl. Ind. Occ.* 691; *Griseb. loc. cit.*; *Engl. in Fl. Bras.* xir. pt. 2, 163, t. 38, f. 19-21 & t. 40, f. 4. *W. alpestris* Macf. *Jam. ii.* 183 [1850]. *Windmannia fruticosa* &c. *Browne Hist. Jam.* 212. (Fig. 107.) Specimens of Swartz's *W. hirta* are in *Herb. Mus. Brit.*

## Bastard Brazilletto, Wild Brazilletto.

In fl. Sept.-Dec.; Coldspring, Swartz! Catherine's Peak; St. George; Macfadyen; Blue Mt. Peak, Purdie! Wilson! Cinchona J.P. 653, Morris! J.P. 1033, Hart! St. George, Watt! Clydesdale, 3660 ft.; Sir John's Peak, 6000 ft.; Harris! Fl. Jam. 5571; Sir John's Peak, Mrs. Britton!—Cuba, Hispaniola, Porto Rico, St. Kitts, Montserrat (Browne), Guadeloupe, Dominica, Martinique, St. Vincent, central America, tropical S. America.

Tree 10-30 ft. high. Twigs, when young, and inflorescence with scattered hairs or densely covered with short brownish-yellow hairs. Leaves 4-7 cm. l.; leaflets in 3 (sometimes more) pairs; lateral oblong-elliptical or elliptical, unequal and narrowed at base, 1-2(-3) cm. l., 5-1(-1.3) cm. br.; terminal elliptical-obovate, a little larger than the lateral;

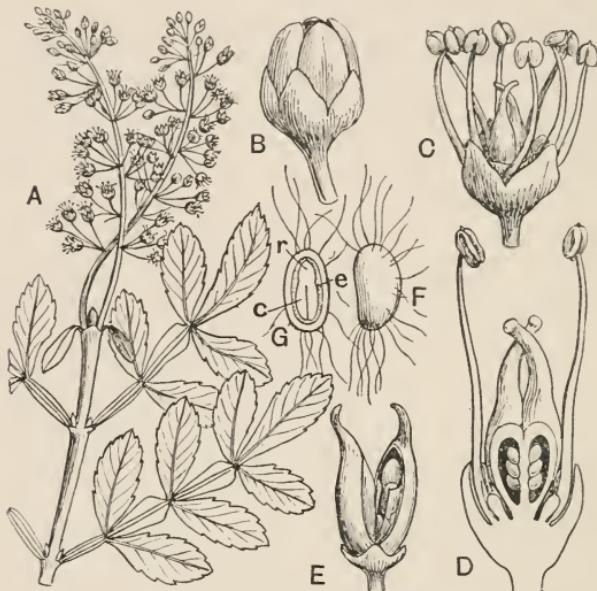


Fig. 107.—*Weinmannia pinnata* L.

A, Inflorescence and leaves  $\times \frac{1}{2}$ .  
 B, Flower bud opening  $\times 8$ .  
 C, Flower, the petals having dropped  $\times 8$ .  
 D, Flower cut lengthwise, with petals and some stamens removed  $\times 16$ .  
 E, Ripe fruit  $\times 4$ .  
 F, Seed  $\times 10$ .  
 G, Ditto cut lengthwise  $\times 10$ ; e, endosperm; c, cotyledons; r, radicle.

margin serrate in the upper two-thirds; wings of petiole obovate to obovate. *Pseudo-racemes* 2-7 cm. l. *Bracteoles* ovate, obtuse, 1 mm. l., or much broader than long, roundish, 6-7 mm. l. *Pedicels* variable in length, shorter than the flowers to thrice as long. *Flowers* variable in size, white. *Sepals* persistent, 1-1.3 mm. l. *Petals* 1.5-1.8 mm. l. *Stamens* 2-2.9 mm. l. *Capsule-valves* oblong-ellipsoidal 3.5-4.5 mm. l.; persistent styles 1.5-2 mm. l.

This species is variable in size of flowers, length of pedicel, and hairiness. The form, *W. hirta* Sw., is rare in the Blue Mts.; it has small numerous flowers, the clusters almost opposite or whorled, pedicels not longer than the flowers, the young twigs, inflorescence, leaves beneath and the petiole, densely covered with brownish-yellow hairs. Another form with small flowers is almost glabrous.

## FAMILY XXXVII. ROSACEÆ.

Herbs, shrubs or trees. Leaves with stipules. Flowers regular, hermaphrodite, perigynous. Sepals 5, imbricate. Petals equal to number of sepals, imbricate, deciduous. Stamens generally indefinite, in one or many whorls, rarely unilateral, free or sometimes connate at base. Carpels one or more, in one or numerous series, 1-celled. Styles as many as the carpels. Ovules generally 2 in each carpel. Embryo generally without endosperm; cotyledons generally almond-like; radicle short, next the hilum.

Species 2000, dispersed all over the world.

Fruit superior, not enclosed by a tubular receptacle.

Trees. Carpel 1.

Style arising from one side near the base.

Stamens 15-numerous, in a complete circle 1. *Chrysobalanus*.

Stamens 3-8, unilateral ..... 2. *Hirtella*.

Style terminal ..... 3. *Prunus*.

Shrubs or herbs. Carpels numerous.

Shrubs with prickles ..... 4. *Rubus*.

Herbs with stolons ..... 5. *Fragaria*.

[Fruit—achenes enclosed in the receptacle. .... *Rosa*.]

## 1. CHRYSOBALANUS L.

Small trees or shrubs. Leaves simple, alternate, leathery, glabrous, entire. Stipules small, deciduous. Cymes axillary and terminal, pubescent. Flowers white, rather small. Receptacle somewhat campanulate. Stamens 10 to numerous, in a single whorl on the upper margin of the receptacle, most fertile. Carpels solitary; ovary 1-celled, sessile at the base of the receptacle; style arising from one side near the base; ovules 2, ascending. Drupe somewhat pulpy, drying up, with one seed. Seed suberec; cotyledons fleshy; radicle inferior.

Species 3, natives of tropical and subtropical America, including W. Indies, and of tropical Africa.

**C. icaco** L. *Sp. Pl.* 513 (1753) (excl. reference to Sloane); *Jacq. Sel. Stirp. Amer.* 154, *t.* 94 & *Ed. pict. t.* 141; *Tussac Fl. Ant.* *iv.* 91, *t.* 31; *Wright Mem.* 277; *Macf. Jam. ii.* 2; *Griseb. Fl. Br. W. Ind.* 229; *Sarg. Silv. iv.* 3, *t.* 148; *Urb. Symb. Ant.* *iv.* 260. **C. pellocarpus** G. F. W. Mey. *Prim. Fl. Esseq.* 193 (1818); *Griseb. loc. cit.* **C. fruticosus** &c. *Browne Hist. Jam.* 250, *t.* 17, *f.* 5 (excl. syn. *Pluk.*). (Fig. 108.)

Coco-plum.

In fl. and fr. Dec.—May; *Wright*! *Masson*! Morass, Bybrook, St. Thomas in the Vale, *Macfadyen*; St. Elizabeth, *McNab*! *Metcalfe*; St. Ann's Bay,

Prior! March! sea-shore, C. Nicholls! Charlton, near Ewarton; Pedro Morass, Upper Clarendon, 3000 ft.; Harris! Charlemont, McGrath! Fl. Jam. 6721, 8488, 8515, 8521, 11,166.—Florida, Bahamas, West Indies, S. America, tropical Africa.

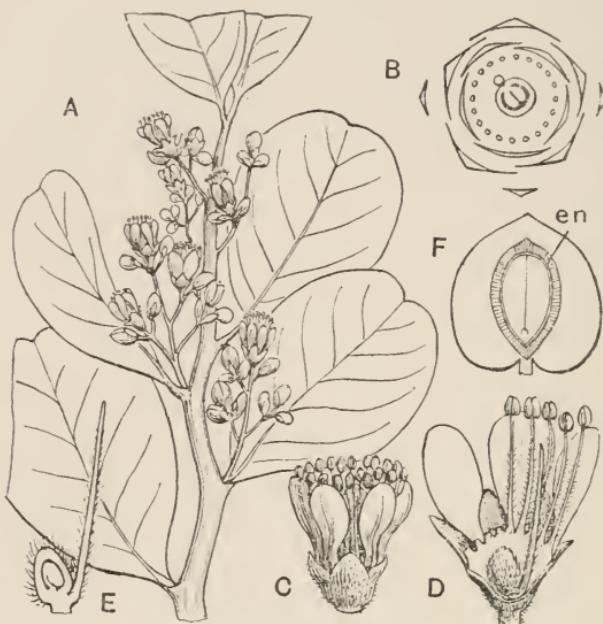


Fig. 108.—*Chrysobalanus icaco* L.

A, Portion of plant  $\times \frac{2}{3}$ .

D, Flower cut lengthwise and four stamens removed  $\times 3$ .

B, Diagram of flower.

E, Pistil with ovary cut lengthwise  $\times 4$ .

C, Flower  $\times 2$ .

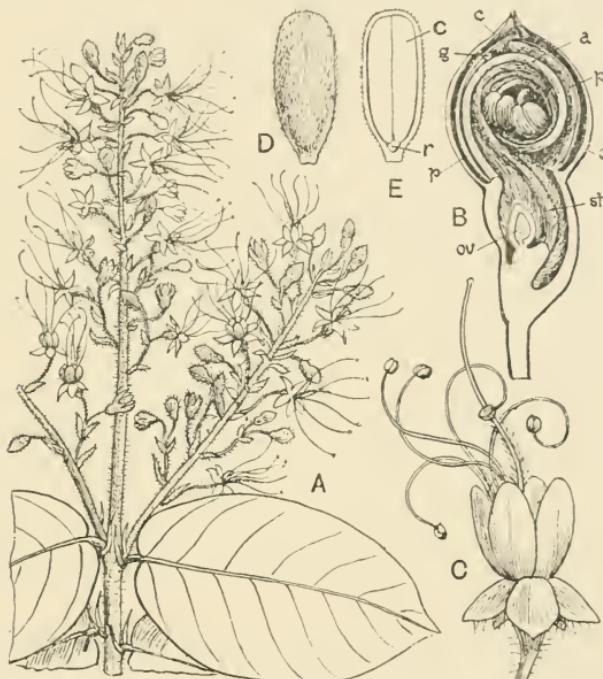
F, Fruit cut lengthwise; *en*, endocarp  $\times \frac{3}{2}$ .

*Tree to 30 ft. high, or shrub. Leaves roundish-elliptical, obovate-roundish, or obovate, apex rounded or emarginate, base rounded or wedge-shaped, 3-10 cm. l., 2.5-7 cm. br. Cymes 3-6 cm. l. Calyx triangular, tomentose outside and more or less pubescent within, about 2.5 mm. l. Petals obovate-spathulate, white, about 5 mm. l. Stamens exserted; filaments villose; anthers sometimes abortive on one side of the flower. Drupes, one or two developing on each cyme, ellipsoidal, nearly spherical, or obovoid; pericarp fleshy or thin, 1.5-3 cm. in diam.*

“The wood is heavy, hard, strong and close-grained . . . a cubic foot weighing 48 lbs. . . . The fruit, which resembles a plum in size and shape, is sweet and rather insipid; it varies in colour and in the amount of juice contained in the flesh, in the degree to which this adheres to the stone, and in the thickness of the wall of the stone” (Sargent). “It is considered astringent, and to be useful in bowel complaints. Prepared with sugar, it forms a favourite conserve with the Spanish colonists, and large quantities are exported from Cuba. The kernels yield a fixed oil, and an emulsion made with them is said to be useful in dysentery” (Macfadyen). The specific name is probably of Carib origin, and is the name still used in many places for the fruit.

## 2. HIRTELLA L.

Trees or shrubs. Leaves simple, alternate, entire. Stipules caducous. Flowers in axillary and terminal panicles or racemes. Flowers generally small. Receptacle tubular. Sepals reflexed. Petals deciduous. Stamens 3–10 or more, perfect stamens on one side only of the receptacle, staminodes on the other side, filaments united at base, long exserted, circinate in bud. Carpels

Fig. 109.—*Hirtella*.\*

A, Portion of inflorescence and a leaf of *H. paniculata* Sw.  $\times \frac{2}{3}$ .  
 B, Flower-bud of same; c, sepals; p, petals; a, stamens; ov, ovary; st, style; g, stigma  $\times 5$ .  
 C, Flower of same  $\times 3$ .  
 D, Fruit of *H. jamaicensis* Urb.  $\times \frac{2}{3}$ .  
 E, Do. cut lengthwise; c, cotyledons; r, radicle  $\times \frac{2}{3}$ .

solitary; ovary inserted on one side of the receptacle, 1-celled; style arising from one side near the base; ovules 2. Fruit drupaceous, dry, with one seed. Seed erect; cotyledons fleshy; radicle inferior.

\* The drawing of A, B, C is made from a specimen of *H. paniculata* Sw., said to have been collected in Jamaica by George Caley. In the absence of confirmation by other specimens we have not included this species, as we know that Caley was in St. Vincent at the date mentioned on the label, which gives no locality.

Species, about 42, natives of Brazil and Guiana, very few in the rest of tropical America and the W. Indies, and one in Madagascar.

Inflorescence a raceme..... 1. *H. racemosa*.  
 Inflorescence paniculate.  
     Fruit 2-2.5 cm. l., densely hairy..... 2. *H. jamaicensis*.  
     Fruit about 1.4 cm. l., sparingly puberulous..... 3. *H. multiflora*.

1. *H. raeemosa* Lam. *Encyc. iii.* 133 (1789) & *Illustr. ii.* 114, t. 138; inflorescence racemose.—*Griseb. Fl. Brit. W. Ind.* 229. *H. americana* *Aubl. Guian.* 247, t. 98 (1775); *Sw. Obs. Bot.* 94; *Hook. f. in Fl. Bras. xiv. pt. 2*, 33 (non *L.* nec *Jacq.*).

*McNab!* (in *Herb. Edinb.*).—St. Vincent, Trinidad, Central America, tropical S. America.

Shrub or small tree, 5-10 ft. high. Leaves very variable, oblong or oblong-lanceolate, acute, acuminate, or long pointed acuminate, glabrous on both sides, or sometimes pubescent on the midrib and beneath, nerves and veins prominulous on both sides, the smaller somewhat leathery, the larger membranous; petioles shortly hairy, 4-6 mm. l.; stipules filiform or setaceous. Racemes axillary and terminal, longer than the leaves, many-flowered, sparingly puberulous, 1-3 dm. l. Bracts awl-shaped, 3-6 mm. l. Pedicels 5-1.5 cm. l. Receptacle campanulate, 3 mm. l. Sepals and petals about 3 mm. l. Stamens 5-7, 8-12 mm. l. Fruit obovoid-oblong, glabrous, woolly inside, 8-12 mm. l.

2. *H. jamaicensis* Urb. *Symb. Ant. v.* 355 (1908); leaves oblong or oblong-elliptical, shortly acuminate, 4-12 cm. l., 2-4 cm. br.; inflorescence paniculate; fruit oblong, truncate at the apex, narrowed at the base, very densely covered outside and inside with buff-coloured hairs, obsoletely ribbed under the hair, 2-2.5 cm. l., 8-1 cm. br. *H. triandra* *Sw. Prodr.* 51 (1788) & *Fl. Ind. Occ.* 508 (in part); *Griseb. op. cit.* 230 (in part). (Fig. 109 D, E.)

In fl. May-Sept., in fr. March-May; *Swartz!* *Macfadyen!* *Wilson!* *Moneague, Prior!* Blue Mts., *Hansen*; Whitfield Hall, Blue Mts., *Harris!* Fl. Jam. 5604.

Small tree, 20 ft. high. Leaves hairy on the midrib, or glabrate, on the upper surface, with short adpressed hairs underneath, midrib on upper surface generally prominent, nerves and veins impressed, flat or slightly prominulous on upper surface, prominent beneath; petioles 2.5-3.5 mm. l.; stipules awl-shaped, 1.5-3 mm. l. Inflorescence 2-4 cm. l., densely pubescent with short buff-coloured hairs. Bracts triangular, 1.5-3 mm. l.; bracteoles much shorter. Calyx-segments 2.5-3 mm. l. Petals 3 mm. l., about 2 mm. br., oval, with a very short claw. Stamens generally 3, 6-8 mm. l. Style 10-11 mm. l., hairy on the lowest third.

3. *H. multiflora* Urb. *Symb. Ant. v.* 356 (1908); leaves oblong-lanceolate to ovate-lanceolate or oblong-elliptical, usually long acuminate, 5-12 cm. l., 2-3.5 cm. br.; inflorescence paniculate; fruit (*fide Urban*) subrectangular, more or less ribbed, bidentate at the apex, narrowed at the very base, with very short hairs sparingly scattered over the surface, 1.3-1.4 cm. l., 6 cm. br.

In fl. Aug.-March; *Purdie!* *March!* Colthirst, Spanish River, about 3000 ft.; *Mansfield*, Bath; *Harris!* John Crow (Blake) Mts., *Harris & Britton!* Fl. Jam. 5317, 5417, 5966, 10,753.

Tree 35 ft. high. *Leaves*, nerves and veins on upper surface prominent, beneath prominent, sparingly hairy on both sides especially on the midrib; petioles 2-3 mm. l.; stipules linear-filiform, 1.5-2.5 mm. l. *Inflorescence* somewhat crowded and corymbose, tomentellose. *Bracts* lanceolate, to triangular, 2-1 mm. l.; bracteoles about 1 mm. l. *Calyx*-segments 2-2.5 mm. l. *Petals* 3-3.5 mm. l., 1.7-1.8 mm. br., ovate or oval, with very minute claw. *Stamens* generally 3, filaments 7-8 mm. l. *Style* 7.5-10 mm. l., hairy on the lower  $\frac{1}{2}$ - $\frac{3}{4}$ .

The specimen Fl. Jam. 10,753 collected by Harris and Britton on the John Crow (Blake) Mts. has broader leaves (to 4.5 cm. br.), and smaller flowers—calyx-segments 2-2.3 mm. l., petals 2.6-2.8 mm. l., 2-2.1 mm. br., roundish-elliptical, style 7.5-8 mm. l., and is possibly another species.

### 3. PRUNUS L.

Trees or shrubs. Leaves alternate, simple. Flowers solitary or racemose. Receptacle obconical, urceolate or tubular, deciduous with the calyx when fruit ripe. Stamens 15-20. Carpels solitary; style terminal; ovules 2, pendulous. Drupe fleshy, with a bony putamen, with one seed. Seed pendulous; endosperm in a thin layer or wanting; radicle superior.

Species over 150, natives chiefly of the temperate regions of the northern hemisphere, fairly abundant in tropical America, rare in tropical Asia.

Leaves 1-2 dm. l. Flowers about 5 mm. l. Fruit ellipsoidal.....	1. <i>P. occidentalis</i> .
Leaves 5-1 dm. l. Flowers about 3 mm. l. Fruit globose, about 1.2 cm. in diam.....	2. <i>P. myrtifolia</i> .

1. *P. occidentalis* Sw. *Prodr.* 80 (1788); leaves large, 1-2 dm. l.; 4.5-7.5 cm. br.; receptacle about 4 mm. l.; sepals about 2 mm. l.; petals about 3 mm. l.; stamens 4 mm. l.; fruit ellipsoidal.—Sw. *Fl. Ind. Occ.* 925; *Griseb. Fl. Br. W. Ind.* 231; *Urb. Symb. Ant.* iv. 260. *Cerasus occidentalis* Loisel. in *Duham. Arb. ed. nov. v. 4* (1800-19); *Macf. Jam. ii. 5*. *Laurocerasus occidentalis* M. Roem. *Fam. Nat. Syn. fasc. 3*, 89 (1847).

#### Prune Tree.

In fl. Feb.-April; in fr. April, May; in the mountains, *Wright!* *Macfadyen!* *St. Mary*, *McNab!* *Purdie!* *Rutherford!* *March!* *Green Valley*, J.P. 1276, *Morris!* *Guava Ridge*; *Newcastle*, 3500 ft.; *Harris!* Fl. Jam. 5591, 10,109, 10,145.—*Cuba*, *Hispaniola*, *Porto Rico*, *St. Kitts*, *Guadeloupe*, *Martinique*, *St. Vincent*, *Trinidad*, *Guatemala*, *Panama*.

A lofty tree, to 40 ft. high. *Leaves* oblong-elliptical or elliptical, sub-acuminate, base rounded to wedge-shaped, glabrous, smooth on upper surface, nerves distinct, but veins obscure on upper surface, nerves prominent beneath. *Racemes* lateral or axillary, solitary or 2 together, sometimes branched, 2-8 cm. l., much shorter than the leaves. *Pedicels* 5-7 mm. l. *Flowers* white, fragrant. *Petals* rounded-obovate. *Stamens*

25 or more, exserted. *Fruit* "size of the common plum of Europe, purple; nut smooth" (Macfadyen).

"The bark of the tree has an astringent taste, with a strong flavour of prussic acid, and is used in manufacturing an inferior description of Prune Dram. It is from the kernels of the drupe that the celebrated liqueur, the Noyau of Martinique, is prepared. They yield a flavour much superior to that of the peach, being rich, oily, and nutty, combined with that of prussic acid. The timber of the tree is of a red colour resembling cedar, and is very hard and durable, and from its taking a fine polish makes a beautiful flooring for houses; but it is not adapted for outdoor work or where it is exposed to the weather, for in such situations it very soon rots" (Macfadyen).

2. *P. myrtifolia* Urb. *Symb. Ant.* v. 93 (1904); leaves 5-1 dm. l.; receptacle about 1.5 mm. l.; sepals about 1 mm. l.; petals about 2.5 mm. l.; stamens about 2 mm. l.; fruit sub-globose, about 1.2 cm. l.—*Urb. Symb. Ant.* iv. 260. *P. sphæro-*

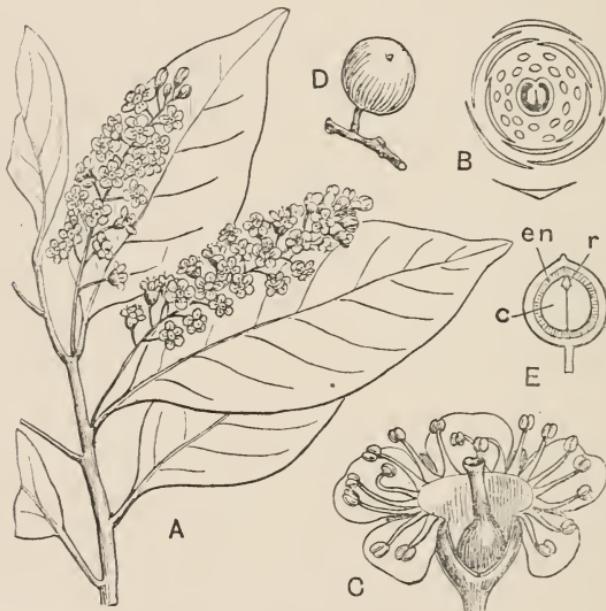


Fig. 110.—*Prunus myrtifolia* Urb.

A, Portion of plant  $\times \frac{2}{3}$ .

B, Diagram of flower.

C, Flower cut on one side  $\times 4$ .

D, Fruit  $\times \frac{2}{3}$ .

E, Fruit cut lengthwise; en, endocarp; c, cotyledon; r, radicle  $\times \frac{2}{3}$ .

*carpa* Sw. *Prodr.* 80 (1788) & *Fl. Ind. Occ.* 927; *Griseb. loc. cit.*; *Hook. f. in Fl. Bras.* xiv. pt. 2, 56, t. 19; *Sarg. Silv.* iv. 51, t. 161. *P. pleuradenia* *Griseb. loc. cit.* (1860). *Celastrus myrtifolius* L. *Sp. Pl.* 196 (1723) & *Hort. Cliff.* 72. *Cerasus sphærocarpa* *Loisel. loc. cit.* (1800-19); *Guilding & Hook. in Bot. Mag.* t. 3141; *Macf. Jam.* ii. 5. *C. reflexa* *Gardn. in Hook.*

*Lond. Journ. Bot. ii. 342 (1843).* Myrti folio arbor, foliis latis subrotundis, flore albo racemoso *Sloane Cat.* 162 & *Hist. ii.* 79 t. 193, f. 1. *Laurocerasus sphaerocarpa M. Roem. loc. cit.* (1847). (Fig. 110.) Type in Herb. Mus. Brit.

Wild Cassada; Ants' Wood.

In fl. Dec.-Feb.; in fr. Aug.; *Sloane* Herb. vi. 72! *Wright!* *Macfadyen!* *Manchester, Purdie!* *Rutherford!* *March!* *St. Thomas in the Vale, Prior!* *Green Valley, J.P. 2093, Morris!* *Plato Road!* *Chester Vale, 3900 ft.;* *Port Royal Mts.; Troy, 1300 ft.;* *Holly Mount, 2000 ft.;* *Content Gap, 2800 ft.;* *Bluefields Mt., 2000-2500 ft.;* *Harris!* *Lancaster;* *Mandeville;* *John Crow (Blake) Mts.;* *Harris & Britton!* *Fl. Jam.* 5521, 5541, 5546, 5969, 8658, 8990, 9121, 9357, 10,209, 10,538, 10,602, 10,739.—*Florida, Bahamas, Cuba, Hispaniola, Porto Rico, Mexico.*

*Tree* 15 to 40 ft. *Leaves* elliptical to oblong-ovate, sometimes somewhat acuminate, base rounded to wedge-shaped, glabrous, shining on upper surface, obscurely veined, 5-12 cm. l., 2.5-4.5 cm. br. *Racemes* axillary, solitary or rarely two together, much shorter than the leaves. *Pedicels* 2-4 mm. l. *Flowers* yellowish-white. *Receptacle* about 1.5 mm. l. *Sepals* minute, about 1 mm. l. *Petals* rounded, slightly clawed, about 2.5 mm. l. *Stamens* 12-20, exserted, about 2 mm. l. *Fruit* subglobose, shining black-purple, about 1.2 cm. in diam.

The wood is heavy, hard, and close-grained, of a light clear red; a cubic foot of absolutely dry wood weighs 56 lbs. (Sargent). See observations on the wood of *P. occidentalis*. The kernel resembles the Bitter Almond in taste, and the bark smells strongly of prussic acid.

#### 4. RUBUS L.

Prickly shrubs, perennial in Jamaican species. Leaves alternate, compound in Jamaican species. Stipules adnate to the leaf-stalk. Flowers in panicles or corymbs, terminal and axillary. Receptacle saucer-shaped, conical in the middle. Sepals persistent. Stamens numerous, inserted on the margin of the receptacle. Carpels numerous, inserted on the conical portion of the receptacle; styles subterminal; ovules 2, pendulous (one often very small). Achenes drupaceous, crowded on the dry receptacle, with one seed. Seed pendulous; cotyledons plano-convex; radicle superior.

Species over 200, abundant in the northern hemisphere, few in the southern.

Calyx not prickly nor bristly.

Greyish villose-tomentulose on young branches,  
under surface of leaves, and calyx ..... 1. *R. jamaicensis.*

Pubescent on young branches, under surface of  
leaves, and calyx. Stem with a purplish tinge 2. *R. alpinus.*

[Calyx prickly or bristly.

Petals white. Fruit yellow ..... *R. ellipticus.*

Petals red. Fruit purplish-black..... *R. racemosus.*]

1. *R. jamaicensis L. Mant.* 75 (1767); stems, when young, more or less greyish villose-tomentellous, at length glabrate;

leaflets 3-5, pubescent, especially on the midrib, or at length glabrescent on the upper surface, beneath generally whitish, sericeous, tomentulose; bracts setaceous or subulate, tomentellous; sepals tomentellous.—*Sw. Obs. Bot.* 205; *Macf. Jam. ii.* 6; *Griseb.*

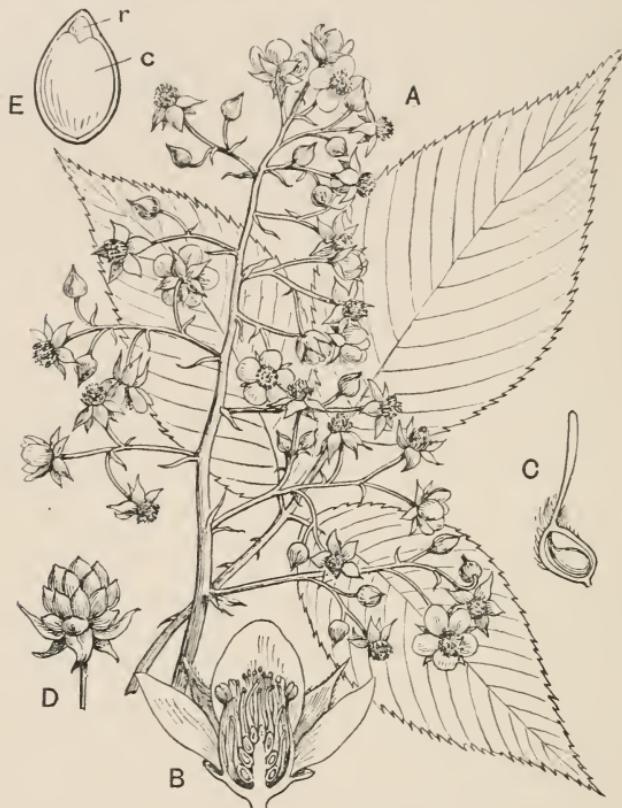


Fig. 111.—*Rubus jamaicensis* L.

A, Leaf and inflorescence  $\times \frac{2}{3}$ .  
 B, Flower cut lengthwise  $\times 3$ .  
 C, Unripe carpel  $\times 10$ .

D, Ripe fruit, nat. size.  
 E, Seed cut lengthwise  $\times 10$ ; c, cotyledon  
 r, radicle.

*Fl. Br. W. Ind.* 231; *Rydberg in N. Amer. Fl.* xxii. 455. *Rubus* foliis longioribus subtus molli lanugine &c. *Sloane Cat.* 173 & *Hist. ii.* 109, t. 213, f. 1. *R. aculeatus* &c. *Browne Hist. Jam.* 242. (Fig. 111.) Type in *Herb. Mus. Brit.*

Blackberry, Bramble.

In fl. throughout the year, but chiefly in spring and summer; in the mountains; Moneague Savanna, *Sloane Herb.* vii. 51! St. Mary, St. Ann, *Browne*; *Wright*! *Swartz*! *Macfadyen*; St. Mary, *McNab*! *Purdie*; *Wullschaegel*; *March*; *Prior*; Prospect Hill, 1000 ft., *Thompson*! *Cinchona*, *Clute*! *Walderton*, 2000 ft.; *Cinchona*, 5000 ft.; *Harris*! *Fl. Jam.* 7946, 9134, 9141.—Hispaniola.

*Stems* with recurved prickles, climbing or trailing. *Leaves* 3-foliate, or those of the stem or vigorous branches 5-foliate; petioles 5-10 cm. l., with recurved prickles; leaflets elliptical or elliptical-ovate, acuminate, acutely and closely serrate, 5-12 cm. l. *Panicles* ample, many-flowered, with branches spreading, more or less sericeous, tomentulose. *Sepals* 5-6 mm. l., lanceolate, acuminate. *Petals* elliptical-obovate, white or pink, about 7.5 mm. l. *Fruit* hemispherical, black when ripe, 8-10 mm. in diam.; achenes 2 mm. l.

“The fruit of this species is very palatable. Infused in spirit with the bruised kernels of the Prune tree (*Prunus occidentalis*), and sweetened with sugar, a liqueur is obtained, not inferior to, and not to be distinguished from, the Copenhagen Cherry Brandy” (Macfadyen).

2. *R. alpinus* Macf. *Jam. ii.* 7 [1850]; stems with a purplish tinge, youngest portions sparsely pubescent, at length glabrate; leaflets 3, glabrous on both sides or sparingly pubescent beneath, mainly on the veins; bracts lanceolate, glabrescent, purplish; sepals somewhat tomentellous-pubescent, especially at the base.—*Griseb. op. cit.* 232; *Rydberg loc. cit.* *R. guyanensis* *Focke in Bremen Abh. iv.* 160 (1874). *R.?* *maximus*, *vix aculeatus*, *foliis ternato-ternatis*, *ovatis*, *quandoque crenatis* *Browne loc. cit.*

#### Alpine Bramble.

In the higher mountains above 3000 ft.; in fl. in the middle of the year; *Browne*; *McNab*; *Macfadyen*; *Purdie*; *J.P. 1376*, *Morris*! *Cinchona*, 5000 ft., *Fawcett*!—Costa Rica, Guatemala, Colombia, Venezuela, Guyana.

*Stems* with recurved prickles, climbing or trailing. *Leaves* 3-foliate; petioles 3-5 cm. l., with a few small prickles; leaflets elliptical, acuminate or sometimes obtuse, finely, unequally and acutely serrate, 4-8 cm. l. *Panicles* narrow, pubescent. *Sepals* 4.5-5 mm. l., lanceolate, cuspidate-acuminate. *Petals* elliptical-obovate, white with a purplish tinge, 5.5-6 mm. l. *Fruit* rounded-ovate, dark purple, 5 mm. in diam.; achenes, 1.5 mm. l.

[*R. racemosus* *Roxb. Fl. Ind. ii.* 519 (1832); branchlets, petioles and inflorescence clothed with glandular hairs; leaflets 5-7, ovate or broadly elliptical-ovate, dark green and almost glabrous on the upper surface, densely white-tomentellous beneath; sepals caudate, tomentellous, bristly.—*Hook. f. Fl. Br. Ind. ii.* 340.

Grown in the Blue Mts., Fl. *Jam.* 7164\*.—Native of Nilghiri and Pulney Mts., India.

A prickly *lush* 5-6 ft. high, with pruinose branches. *Petals* large, red. *Carpels* woolly. *Fruit* purplish-black, large and most delicious.

Introduced by one of us into Jamaica about the year 1890. It is well worthy of cultivation wherever it will grow.]

[*R. ellipticus* *Smith in Rees Cyclop. xxx. Rubus* 16 (1813); stems shaggy with spreading reddish-brown hairs; leaflets 3, roundish, obovate or elliptical, dark green and glabrous on the upper surface, tomentellous whitish in colour beneath; calyx tomentellous, bristly.—*Hook. f. Fl. Brit. Ind. ii.* 336.

Naturalized in the Blue Mts., Cinchona, *Harris!* Fl. Jam. 9131.—Native of temperate and subtropical Himalaya, also of mountains of Khasia, Birma, and Ceylon, and of Yunnan.

A tall erect prickly bush, attaining a height of 15 ft., and forming dense thickets. Leaflets 5-10 cm. l. Petals white. Fruit yellow, edible and pleasantly flavoured.

Introduced by one of us into Jamaica in 1894.]

### 5. FRAGARIA L.

Herbs, becoming perennial at the base, generally bearing stolons. Leaves alternate, 3-foliate; leaflets obovate, incise-serrate. Stipules adnate to the base of the petiole, sheathing. Scapes erect, with a few flowers in cymes. Flowers polygamo-

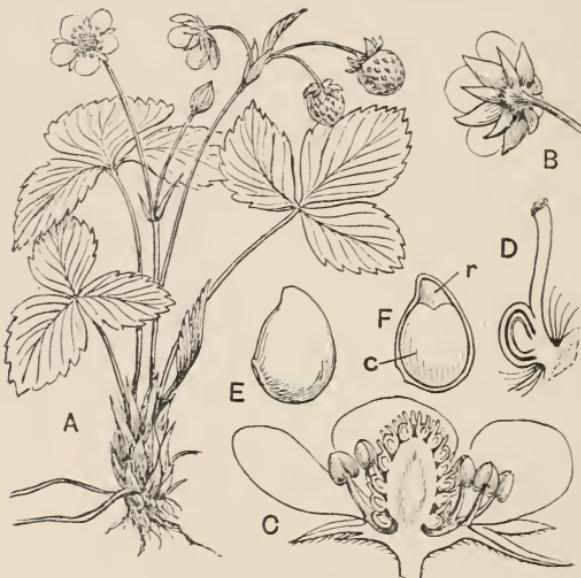


Fig. 112.—*Fragaria vesca* L.

A, Plant  $\times \frac{2}{3}$ .

B, Flower seen from below, nat. size.

C, Flower cut lengthwise  $\times 4$ .

D, Carpel cut lengthwise  $\times 20$ .

E, Achene  $\times 12$ .

F, Ditto cut lengthwise  $\times 12$ ; c, cotyledon  
r, radicle.

diœcious. Receptacle oboconical, produced into a hemispherical or convex central portion on which the carpels are borne. Epicalyx of 5 segments. Sepals 5, persistent, spreading, valvate. Petals 5. Stamens about 20. Carpels numerous, separate; styles ventral, persistent; ovule solitary, ascending. Achenes numerous, minute, generally partially embedded in the receptacle which becomes large and fleshy or spongy as the fruit ripens, deciduous, dry. Seed ascending; cotyledons plano-convex; radicle superior.

Species about 8, natives of temperate and alpine regions of the northern hemisphere and of the mountains of South America.

Flowers white. Fruit edible..... *F. vesca*.  
[Flowers yellow. Fruit not edible ..... *F. indica*.]

*F. vesca* *L. Sp. Pl.* 494 (1753); flowers white; fruit edible.—*Griseb. Fl. Br. W. Ind.* 232; *Hook. f. in Fl. Bras.* xiv. pt. 2, 66 & *Fl. Br. Ind.* ii. 344. *F. mexicana* *Schlecht. in Linnaea.* xiii. 265 (1839); *Hemsl. Biol. Centr. Amer. Bot.* i. 375. *F. insularis* *Rydberg in N. Amer. Fl.* xxii. 359 (1908). (Fig. 112.)

Wild Strawberry, Alpine Strawberry.

Common in the Blue Mts., J.P. 1179, Morris! Cinchona, 5000 ft., Clute! also Harris! Fl. Jam. 9216; Hardware Gap, Britton, 3324!—Distribution of the genus.

Flowers less than 1 cm. to 1.5 cm. in diam. Segments of epicalyx and sepals 3-5 mm. l. in fl. Fruit 8-1.5 cm. in diam.

[*F. indica* *Andr. Bot. Rep.* t. 479 (about 1807); flowers yellow; fruit not edible.—*Hook. f. in Fl. Br. Ind.* ii. 343. *Duchesnea indica* *Focke in Engl.-Prantl Pfzsm.* iii. pt. 3, 33 (1894); *Rydberg tom. cit.* 356.

Naturalized in Darliston Mts.—Mts. of India, Afghanistan, Malay Is., Japan, Corea, Formosa; naturalized in N. America, Bermuda and in most tropical and subtropical regions.

Flowers 1.5-2 cm. in diam. Segments of epicalyx often exceeding the sepals, and generally toothed. Sepals 7-9 mm. l. in fl. Fruit about 1 cm. in diam.]

### [*ROSA* L.]

Erect shrubs, generally furnished with prickles. Leaves alternate, imparipinnate; leaflets serrate. Stipules adnate to the sheathing base of the leaf-stalk. Flowers solitary or in corymbs, large. Receptacle urceolate. Sepals spreading, leafy, often pinnatisect, deciduous or persistent. Stamens numerous, in numerous whorls, inserted on the upper margin of the receptacle. Carpels numerous, free, attached to the base and sides of the receptacle; styles ventral, exserted; ovule solitary, pendulous. Achenes numerous, enclosed in the fleshy receptacle. Seed pendulous; cotyledons plano-convex; radicle superior.

Species, more than 100, natives of temperate and subalpine regions of the northern hemisphere, but fewer in America; the southern limits of the genus are found in Abyssinia, India and Central America.

Flowers white—

Calyx bristly..... *R. lavigata*.

Calyx tomentose, surrounded by bracts..... *R. bracteata*.

Flowers red..... *R. indica*.

*R. laevigata* Michx. *Fl. Bor. Am.* i. 295 (1803); flowers white; calyx bristly.—*Lindl. Ros. Monogr.* 125; *Griseb. Fl. Br. W. Ind.* 231. *R. cherokeensis* Donn Hort. *Cantab. ed.* 8, 170 (1815); *Small Fl. S. E. U. States*, 528. *R. sinica* *Lindl. op. cit.* 126, t. 16 (1820) (non *L.*), t. 29 in *Banks MSS.* No. 12.

Cherokee Rose, Buckthorn.

Spontaneous; Port Royal Mts. McNab! *Wullschaegel*; Moneague, Prior! near Cinchona, *Fawcett*! *Christiana*, Miss Wood! *Fl. Jam.* 7162\*.—China, Japan, southern U. States.

Stems long, trailing, smooth, with stout, curved prickles. Leaflets generally 3, smooth, shining, glabrous; petioles with small recurved prickles; stipules lanceolate, acuminate, glandular-serrulate. Flowers large, pure white, odourless, solitary; stalks bristly. Receptacle bristly. Sepals somewhat bristly. Petals roundish, 4 cm. in diam. or larger. Fruit orange-red, very bristly, somewhat pyriform, 2-2.5 cm. l.

Two forms have been described as species by Lindley: one, *R. laevigata*, with persistent, half-adherent stipules, petioles and midribs of leaves without prickles; and the other, *R. sinica*, with deciduous, subulate stipules, and prickly petioles and ribs.

*R. bracteata* *Wendl. Bot. Beobacht.* 50 (1798); flowers white; calyx tomentose, surrounded by bracts.—*Small op. cit.* 526.

Macartney Rose.

Naturalized in Blue Mts., between Hardware Gap and Rose Hill, 3600 ft., *Harris*! *Fl. Jam.* 5711, 10,133.—China, naturalized in southern United States.

Bush about 2 ft. high, but trailing over neighbouring bushes. Branches erect, tomentose, with strong, recurved, often twin prickles. Leaflets 3-9, elliptical, obtuse, narrowing somewhat to base, minutely serrulate, shining above, glabrous or puberulous beneath; petioles glandular, prickly; stipules nearly free, tomentose, pectinate. Flowers pure white, scent somewhat like bitter almonds, solitary, or a few together; stalks short, tomentose. Receptacle and sepals densely tomentose. Bracts large pectinate, surrounding the base of the flower. Petals large, roundish, retuse or emarginate, 4.5 cm. in diam. Fruit large, spherical, orange-red, tomentose.

*R. indica* L. *Herb. & Lindl. Ros. Monogr.* 106 (1820), non *L. Sp. Pl.* 492 (1753); flowers red. *R. sinica* L.\* *Sp. Pl.* 402 (1753).—*Hook. f. Fl. Br. Ind. ii.* 364.

Blush Rose, China Rose, Monthly Rose.

Naturalized, Resource, Blue Mts., *Harris*! *Fl. Jam.* 6912.—China.

Bush 6 ft. high, with few prickles on branches. Leaflets 3-5, elliptical, acuminate, glabrous; petioles with glandular hairs and recurved prickles; stipules glandular, linear, acuminate, adherent about two-thirds their length. Flowers dark rose colour, fragrant, numerous, corymbose; stalks glandular. Sepals lanceolate, acuminate, glandular outside.]

\* See note in *Journ. Bot.* lii. 184 (1914).

## FAMILY XXXVIII. CONNARACEÆ.

Trees or shrubs. Leaves alternate, without stipules, imparipinnate or 1-3-foliolate; leaflets entire. Flowers small, hermaphrodite, regular. Calyx with 5 segments, in *Rourea* persistent and hardened in fruit. Petals 5, imbricate. Stamens 5 or 10, those opposite the petals shorter; filaments generally united at the base. Carpels 5, globose, free, hairy, 1-celled. Ovules 2, collateral, ascending from the base. Fruit a solitary follicle. Seed solitary, erect, usually with an aril. Endosperm none or fleshy.

Species about 140, of which the greatest number are natives of South America and south-west Asia, some occur in tropical Africa, very few in the West Indies, Central America, and the Pacific Islands, none in North America, nor Australia.

## ROUREA Aubl.

Woody vines, shrubs, or small trees. Leaves imparipinnate, rarely with one leaflet, the twigs often ending in a strong tendril or hook. Panicles axillary or terminal, with numerous small flowers. Calyx-segments imbricate; tube enlarged after flowering. Stamens 10. Carpels, 1 fertile, 4 generally imperfect. Follicle sessile. Seed generally longer than the aril. Endosperm none.

Species 42, natives of tropical America and Asia, one African.

Sepals triangular, ciliolate along margin. Carpels  
much shorter than the stamens..... 1. *R. paucifoliolata*.  
Sepals oblong, with a tuft of hair at the apex. Carpels  
subequal to the stamens ..... 2. *R. glabra*.

1. *R. paucifoliolata* *Planch.* in *Linnæa xxiii.* 415 (1850); calyx-segments ovate-deltoid, subcordate at the base, puberulous on the inside and ciliolate along the margin; carpels much shorter than the stamens.—*Britton in N. Amer. Fl. xxii.* 234; *R. oblongifolia* *Hook. & Arn.* var. *floribunda* *Planch. loc. cit.* (1850); *R. glabra* *Griseb. Fl. Brit. W. Ind.* 228 (1860) (in part); *Bak. in Fl. Bras. xiv. pt. 2,* 182 (in part); (non *H. B. & K.*). (Fig. 113.)

In fl. Aug.; in fr. March, April; *Macfadyen*! *Distin*! March! Holly Mount, Mt. Diablo; near Troy, 2000 ft.; near Schwallenberg, St. Ann; *Harris*! *Fl. Jam.* 8492, 8753, 9423, 10,336.

Shrub "climbing by means of woody tendrils... to a length of 90 ft." (*Harris*). Leaflets 3-9, rarely only 1, oblong-elliptical, acuminate, somewhat leathery, nerves and veins slightly prominulous on both sides, 3.5-7.5 cm. l., 2-3 cm. br. Panicles crowded towards the end of the branches, equalling, or longer than, the leaves, about 10 cm. l. Calyx

segments 3 mm. l., tube 2 mm. l. in fr. Petals oblong or somewhat obovate, irregular in form especially at apex, about 5 mm. l. Stamens, the long stamens longer than, and the short stamens shorter than, the petals. Carpels about 2 mm. l. Follicle about 1.5 cm. l. Seed 1 cm. l.; aril 4 mm. l.



Fig. 113.—*Rourea paucifoliolata* Planch.

A, Portion of inflorescence and leaf  $\times \frac{2}{3}$ .  
 B, Flower  $\times 3$ .  
 C, Flower cut lengthwise  $\times 3$ .  
 D, Carpel  $\times 10$ .  
 E, Follicle nat. size.

F, Follicle dehisced showing the seed, nat. size.  
 G, Seed cut lengthwise; c, cotyledon; r, radicle; nat. size.

2. *R. glabra* H. B. & K. Nov. Gen. & Sp. vii. 41 (1824); calyx-segments oblong or elliptical, with a tuft of short hairs at the apex, and slightly ciliolate at the base; carpels subequal to the stamens.—*Griseb. loc. cit.* (in part); *Bak. loc. cit.* (in part); *Urb. Symb. Ant.* iv. 262; *Britton tom. cit.* 233.

In fl. May-Dec.; in fr. Jan.; *Masson.*—Porto Rico, St. Lucia, tropical continental America.

Trailing shrub or small tree. Leaflets 3-5, oblong elliptical to oblong, acuminate, leathery, nerves and veins distinctly prominulous on both sides, 4-11 cm. l., 2-5 cm. br. Panicles lax, shorter than the leaves, 5-8 cm. l. Flowers white. Calyx-segments unequal and asymmetrical, 3-3.5 mm. l.; tube about 2 mm. l. in fr. Petals spatulate, about 5 mm. l. Stamens slightly shorter than the petals. Follicle 1-1.4 cm. l. Seed 1 cm. l.; aril 4 mm. l.

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Pond Apple . . . .	195	<i>dichotoma</i> &c. Browne . .	156
PORTULACA L. . . .	168	<i>humilis</i> L. (fig. 53) . .	156
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<i>Sloane</i> . . . .	166	<i>octandra</i> L. . . .	156
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<i>oleracea</i> L. (fig. 68) . .	169	<i>bracteata</i> Wendl. . . .	264
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	PAGE		PAGE
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Water Hemp . . . . .	133	XIMENIA L. . . . .	85
Wax Wood . . . . .	32	<i>aculeata</i> Tuss. . . . .	86
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# PLATES





## EXPLANATION OF PLATE 1

### A. *Peperomia verticillata*

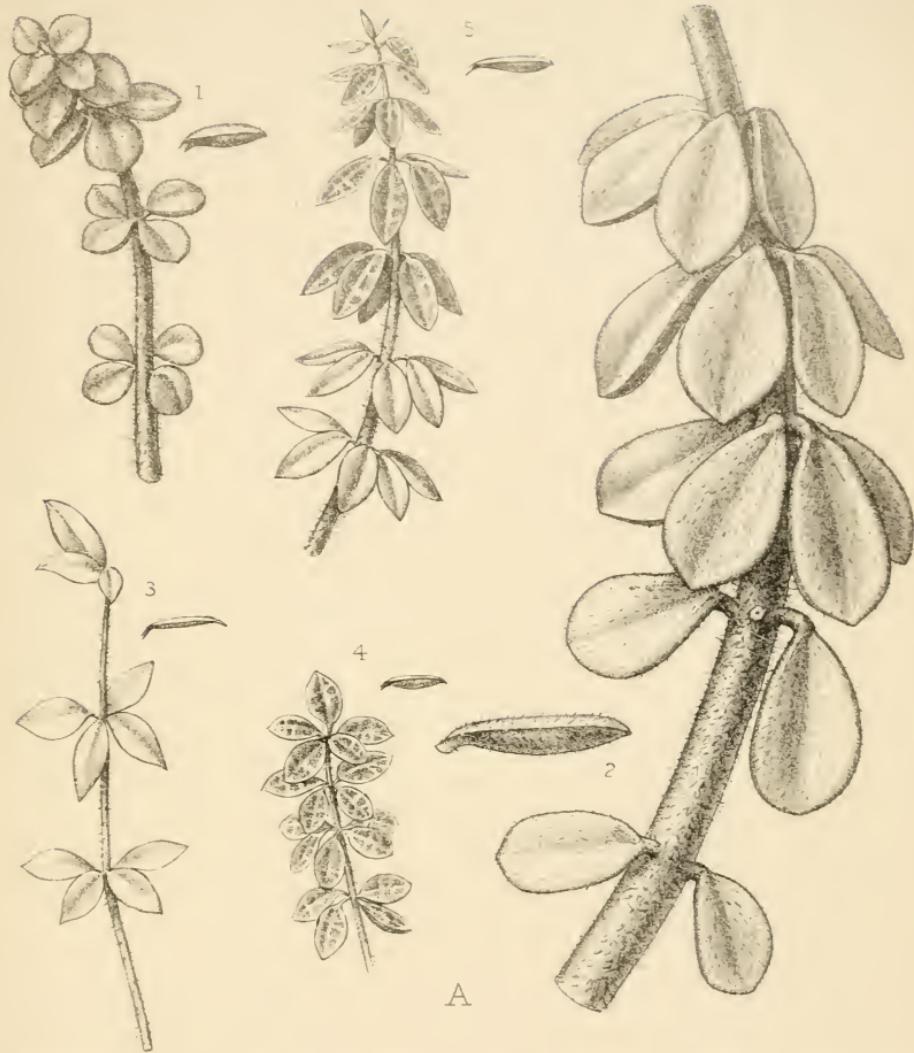
- 1 and 2. Portions of stems from a plant growing in the Cambridge Botanic Garden, with side view of leaves.
- 3 and 4. Portions of stems from another plant growing in the Cambridge Botanic Garden (*P. rubella*), with side view of leaves.
5. Portion of stem of a plant growing in the Royal Botanic Gardens, Kew (*P. rubella*), with side view of leaf.

### B. Flowers and fruit of species of *Pilea*

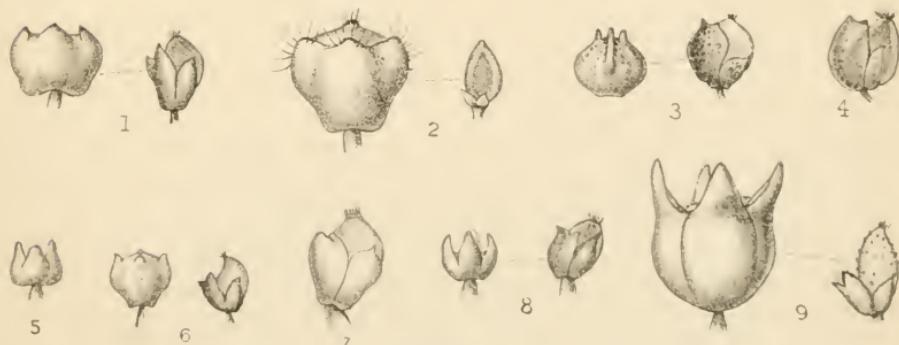
1. *P. microphylla*, male flower and fruit.
2. *P. herniaroides*, male flower and fruit.
3. *P. nudicaulis*, male flower and fruit.
4. *P. lanceolata*, fruit.
5. *P. flavicaulis*, male flower.
6. *P. Parietaria*, male flower and fruit.
7. *P. virgata*, fruit.
8. *P. alpestris*, male flower and fruit.
9. *P. lucida*, male flower and fruit.

A. 1-5 natural size.

B. 1-9  $\times$  10.



A



B

P. Highley del. et lith.

C. Hodges &amp; Son imp.

A. *Peperomia verticillata*.B. Flowers and fruit of *Pilea* spp.





## EXPLANATION OF PLATE 2

### *Pilea ob lanceolata*

1. Plant, natural size.
4. *a*, *b*, female flower in different stages; *c*, fruit with perianth and staminodes (*s*) folded in; *d*, perianth (*p*) and staminodes (*s*) opened out; *e*, cystoliths on portion of upper surface of leaf.

### *Pilea Weddellii*

2. *a*, male flower; *b*, *c*, *d*, *e*, female flower in various stages; *f*, fruit; *g*, perianth (*p*) with staminodes (*s*) after escape of achene; *h*, cystoliths on portion of upper surface of leaf.

### *Pilea rufescens*

3. *a*, male flower; *b*, fruit; *c*, cystoliths on portion of upper surface of leaf.

### *Pilea Elizabethae*

5. *a*, male flower; *b*, cystoliths on portion of upper surface of leaf.

### *Pilea appendiculata*

6. *a*, male flower; *b*, female flower; *c*, cystoliths on portion of upper surface of leaf.

### *Pilea troyensis*

7. *a*, male flower; *b*, fruit; *c*, cystoliths on portion of upper surface of leaf.

### *Pilea lamiifolia*

8. *a*, male flower; *b*, fruit; *c*, cystoliths on portion of upper surface of leaf.

### *Pilea Hollickii*

9. *a*, male flower; *b*, cystoliths on portion of upper surface of leaf.

### *Pilea silvicola*

10. *a*, male flower; *b*, fruit; *c*, cystoliths on portion of upper surface of leaf.

Figs. 2--10 all  $\times 10$ , except fig. 2, *b*, *c*, *d*, and 4, *a*, which are  $\times 20$ . The fruit is in each case surrounded by the persistent perianth. The hairs on leaf-surface, where they occur, are not indicated.



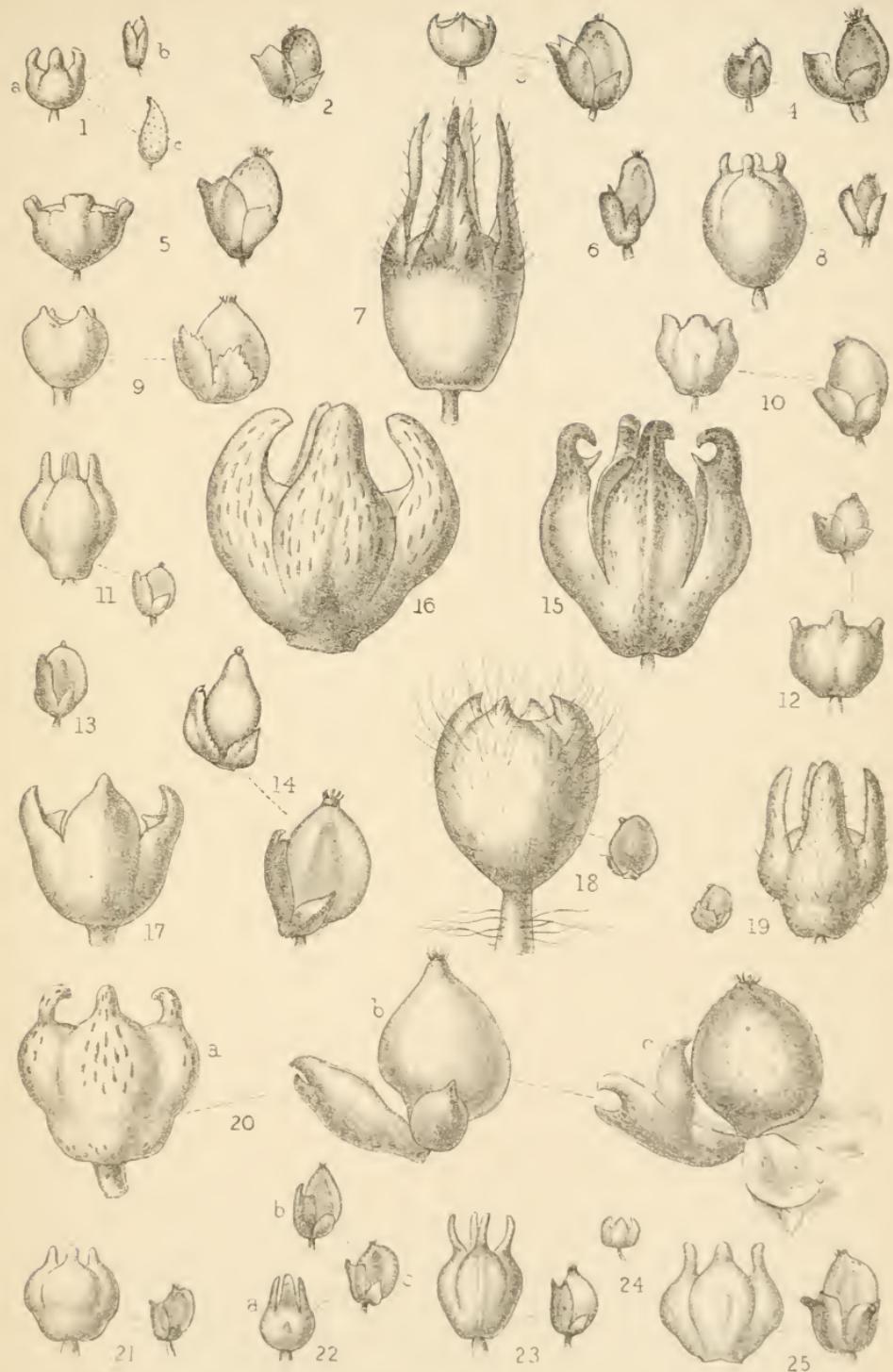




### EXPLANATION OF PLATE 3

1. *Pilea crenulata*, *a*, male flower ; *b*, female flower ; *c*, fruit.
2. *Pilea Wilsonii*, fruit.
3. *Pilea rufa*, male flower and fruit.
4. *Pilea saxicola*, female flower and fruit.
5. *Pilea Wullschlaegelii*, male flower and fruit.
6. *Pilea clandestina*, fruit.
7. *Pilea ciliata*, male flower.
8. *Pilea serrulata*, male and female flowers.
9. *Pilea reticulata*, male flower and fruit.
10. *Pilea crassifolia*, male flower and fruit.
11. *Pilea grandifolia*, male flower and fruit.
12. *Pilea brevistipula*, male flower and fruit.
13. *Pilea dauciodora* var. *parvifolia*, fruit.
14. *Pilea sessiliflora*, female flower and fruit.
15. *Pilea impressa*, male flower.
16. *Pilea impressa* var. *troyana*, male flower.
17. *Pilea radicans*, male flower.
18. *Pilea numularifolia*, male flower and fruit.
19. *Pilea depressa*, male flower and fruit.
20. *Pilea rotundata*, *a*, male flower ; *b*, female flower with staminodes folded in ; *c*, fruit with staminodes opened out.
21. *Pilea repens*, male flower and fruit.
22. *Pilea Harrisii*, *a*, male flower ; *b*, fruit immature ; *c*, fruit of Fl. Jam. 10,683.
23. *Pilea obtusata*, male flower and fruit.
24. *Pilea diffusa*, male flower.
25. *Pilea nigrescens*, male flower and fruit.

Figs. all  $\times 10$ . The fruit is surrounded by the persistent perianth except in fig. 1 *c*.



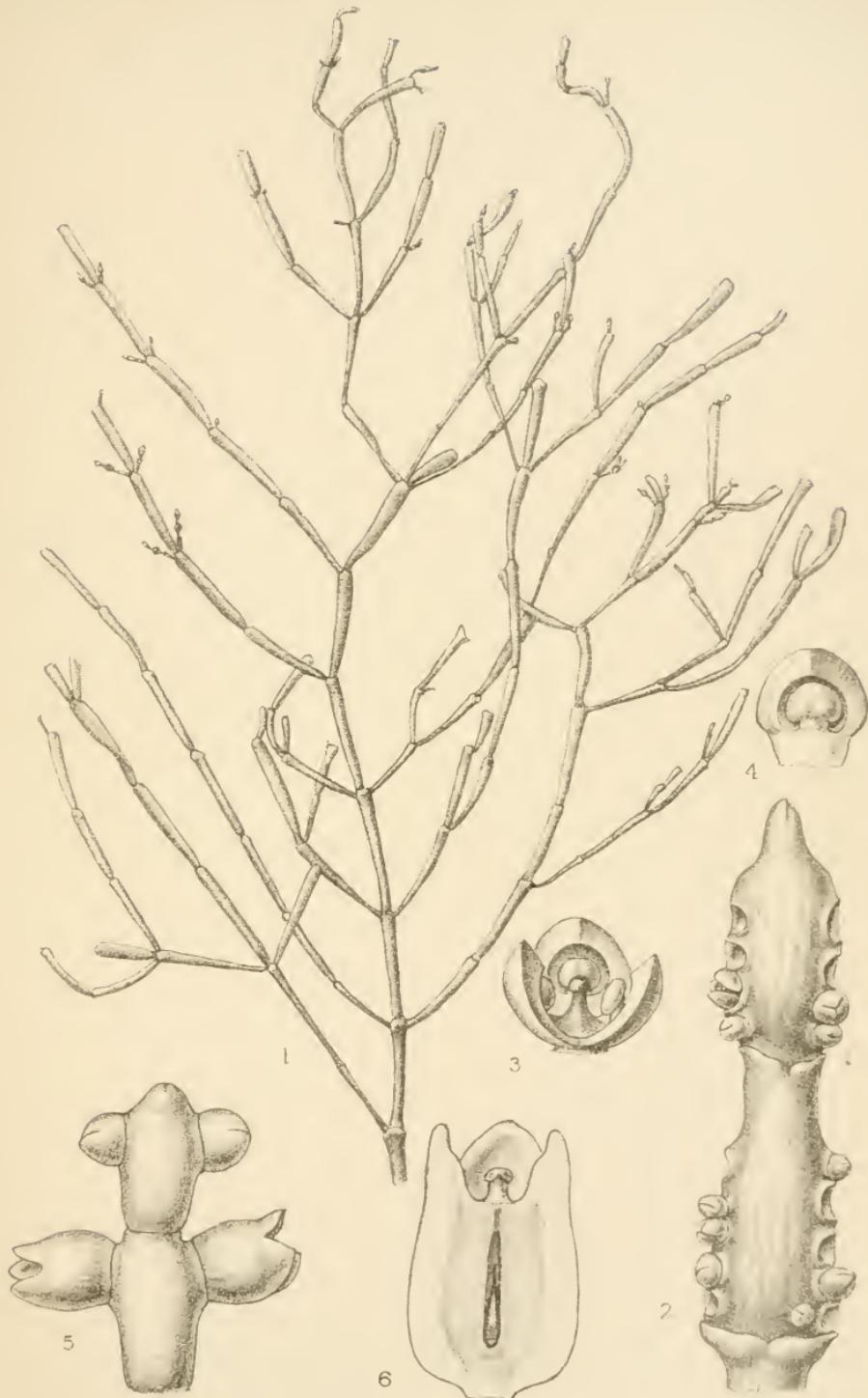




## EXPLANATION OF PLATE 4

### *Dendrophthora opuntioides*

1. Portion of plant  $\times \frac{2}{5}$ .
2. Two joints of male inflorescence  $\times 4$ .
3. Male flower opened  $\times 16$ .
4. Petal with stamen of ditto  $\times 16$ .
5. Two joints of female inflorescence  $\times 5$ .
6. Female flower in section after pollination, with undeveloped ovule  $\times 10$ .



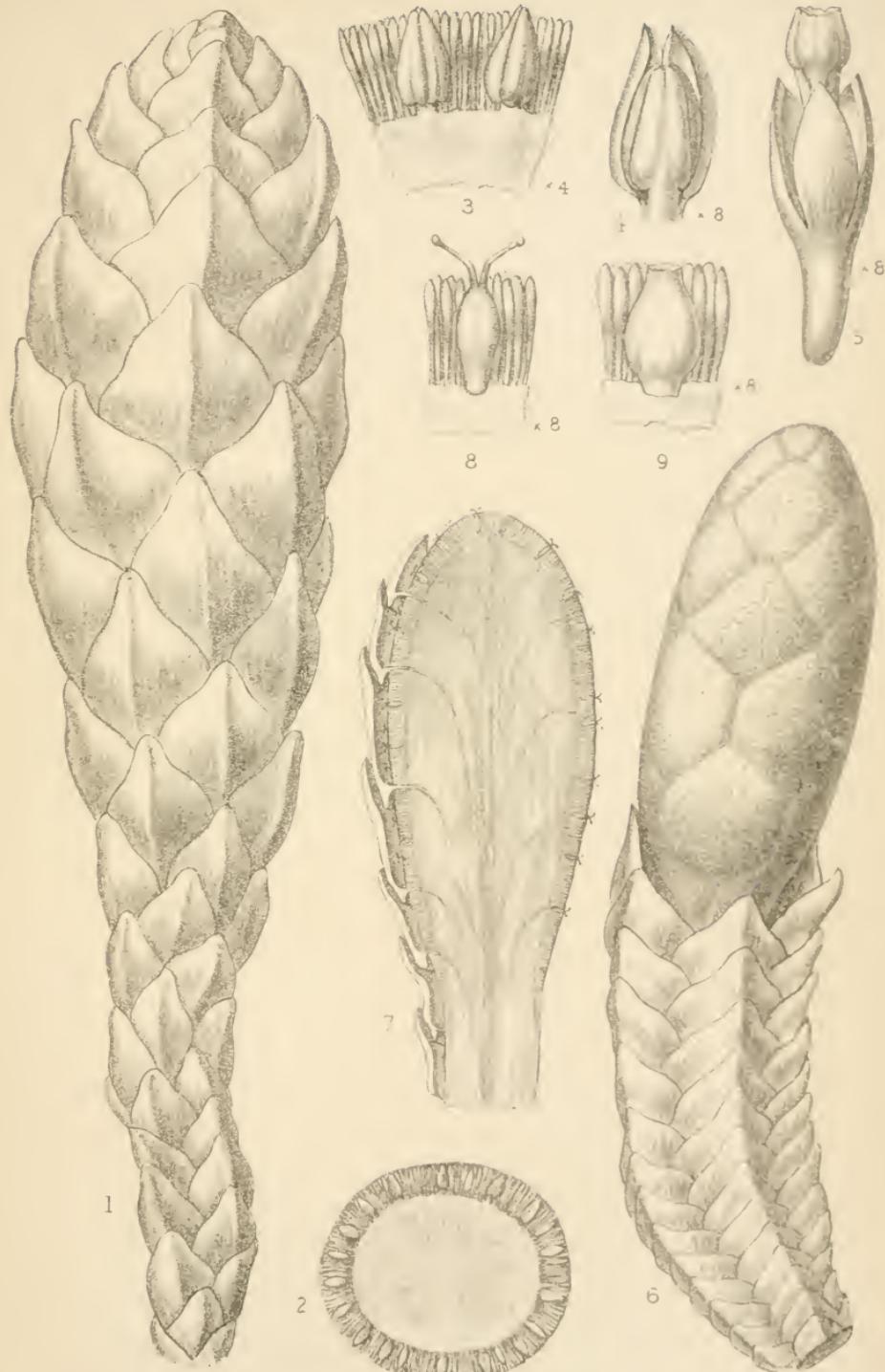




## EXPLANATION OF PLATE 5

### *Scybalium jamaicense*

1. Male inflorescence covered with imbricate bracts, natural size.
2. Transverse section of male spadix, showing male flowers interspersed with scales, natural size.
3. Portion of receptacle, with two male flower-buds and scales  $\times 4$ .
4. Bud of male flower with one lobe of the perianth removed  $\times 8$ .
5. Male flower with anther dehisced  $\times 8$  (after Hooker fil. in Trans. Linn. Soc. xxii. t. 11).
6. Female inflorescence, bracts covering peduncle but deciduous from spadix, natural size.
7. Longitudinal section of female spadix, showing the sub-peltate imbricate bracts, and the female flowers interspersed with scales, natural size.
8. Portion of receptacle, with female flower and scales  $\times 8$ .
9. Portion of receptacle with fruit and scales  $\times 8$  (after Hooker fil. loc. cit.).









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